ICE AND Refrigeration

PUBLISHED BY NICKERSON & COLLINS CO., CHICAGO - NEW YORK

58th YEAR ★ JUNE, 1949

SURE WAY TO REDUCE ENGINE UPKEEP COSTS

Keep engines clean by lubricating with *Texaco D-303 Motor Oil*

UPKEEP costs for heavy-duty gasoline and Diesel engines are sure to be low when engines are kept clean . . . and you can keep your engines clean—free of harmful carbon, gum and sludge—by lubricating them with *Texaco D-303 Motor Oil.*

Texaco D-303 Motor Oil resists oxidation . . . is fully detergent and dispersive . . . keeps deposit-forming materials in suspension until oil change time. Bearings get full protection against corrosion—all parts last longer and operate more efficiently. Your engines deliver more power, use less fuel, require fewer repairs, replacements and overhauls.

Let a Texaco Lubrication Engineer show you how *Texaco D-303 Motor Oil* and other Texaco Products can reduce your fleet operating costs. Call the nearest of the more than 2300 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

SPEND LESS ON CHASSIS MAINTENANCE —All chassis parts last longer when you protect them with longer-lasting *Texaco Marfak.* It resists squeeze-out, jar-out and wash-out . . . protects against rust and wear . . . assures smoother operation . . . requires fewer applications.

Wheel bearings are protected for extra thousands of miles when you use *Texaco Marfak Heavy Duty.* It seals itself in—seals out dirt and moisture. It assures safer braking and needs no seasonal repacking.

TEXACO

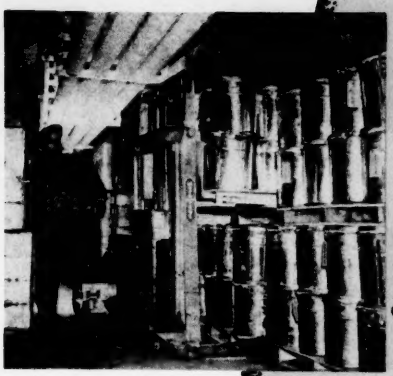
TEXACO Lubricants and Fuels

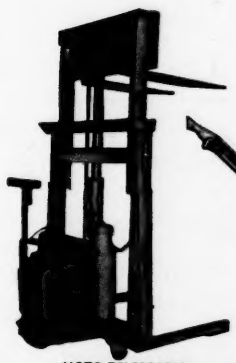
FOR ALL TRUCKING EQUIPMENT

Tune in . . . TEXACO STAR THEATRE every Wednesday night starring Milton Berle. See newspaper for time and station.

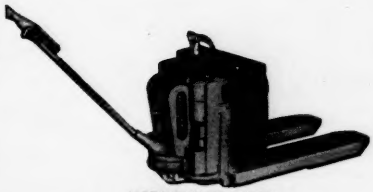
ICE AND REFRIGERATION, Nickerson & Collins Co., Publishers, 433-435 N. Waller Ave., Chicago 44, Ill. Published monthly, Vol. 116, No. 6, June, 1949. Entered as second-class matter August 8, 1891, Chicago, Ill., under the Act of March 3, 1879. Additional entry at Beloit, Wis., April 20, 1948. Copyright 1949. Subscription in the U. S. $3.00 per year; other countries $4.00.

MOTO-TRUCS *save you money many ways*





MOTO-TELESCOPIC HI-LIFT TRUCK



MOTO-PALLET TRUCK
Patented Nydegger Shackles on load wheels insures smooth travel over uneven floors and into elevators, trailers, etc.

YOUR SAVING IS IN THE BAG WHEN YOU OPERATE MOTO-TRUCS!

Due to its shorter overall length (up to 15″), the Moto-Truc operates in narrower aisles, shorter elevators, smaller loading docks and in many places where space is a factor.

THE MANAGEMENT says "The Moto-Truc has been a profitable investment for us"

THE SUPERINTENDENT says "It would be difficult to operate without the Moto-Truc."

THE MATERIALS HANDLING ENGINEER says "I knew what I was recommending when I recommended Moto-Trucs; they did not let me down"

THE PURCHASING AGENT says "Quality and price go together in Moto-Trucs"

THE FOREMAN says "I can get more tonnage moved per man with Moto-Trucs"

THE SERVICE MAN says "The Moto-Truc is easier to service and maintain. There is nothing as simple in design. It has less operating parts and is so accessible that there is no long delay for servicing"

THE OPERATOR says "Give me a Moto-Truc and I will go places, do things and turn out a better day's job.

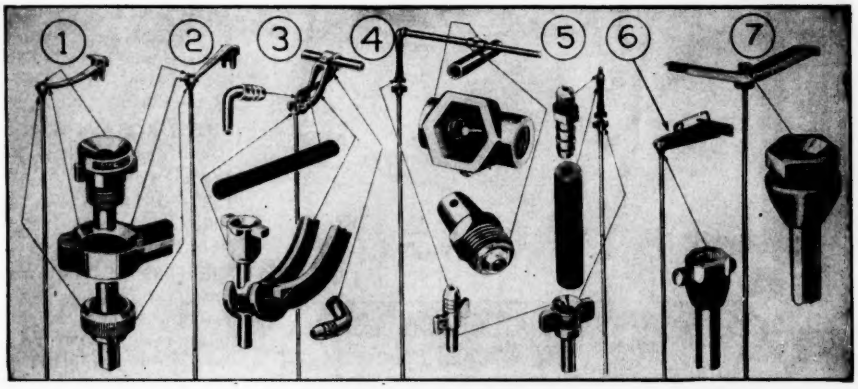
WRITE FOR BULLETIN No. 49

The MOTO-TRUC Co.
1953 E. 59th Street
CLEVELAND 3, OHIO.
ORIGINATORS OF MOTORIZED HAND TRUCKS

PRODUCE PURE CRYSTAL CLEAR SANITARY ICE WITH OUR EXCLUSIVE

martocello Air Agitation Systems

- MARTOCELLO SELF-CENTERING DROP TUBE BRACKET, Offset Form
- MARTOCELLO SELF-CENTERING DROP TUBE BRACKET, Straight Form
- MARTOCELLO SERIES DROP TUBE BRACKET
- DOUBLE BRACKET SYSTEM ASSEMBLY
- SERIES DROP TUBE ASSEMBLY
- GALVANIZED STEEL TRUNNION TYPE BRACKET ASSEMBLY
- GALVANIZED STEEL SADDLE BRACKET ASSEMBLY



New Price List Now Available! Send For Your Copy Today!

Jos. A. Martocello & Co.

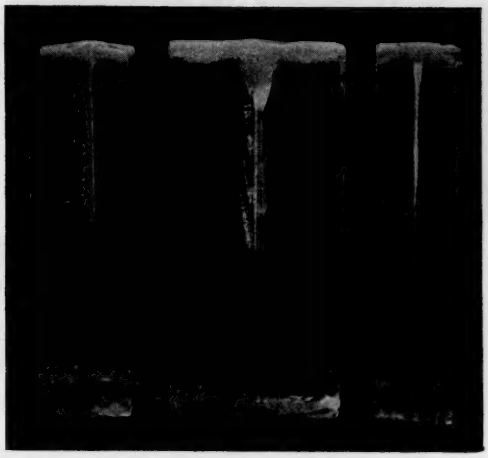
229-231 NORTH 13th STREET
PHILADELPHIA 7, PA.

"Serving the Ice Industry Since 1916"... "There is no Substitute for **MARTOCELLO QUALITY**"

Save **TIME** with MARTOCELLO EQUIPMENT

OBTAIN A CLEAR BLOCK OF ICE EVERYTIME with

DEPENDABLE ECONOMICAL



MARTOCELLO

ICE SYSTEMS & Supplies
AT LOWER OPERATING COSTS

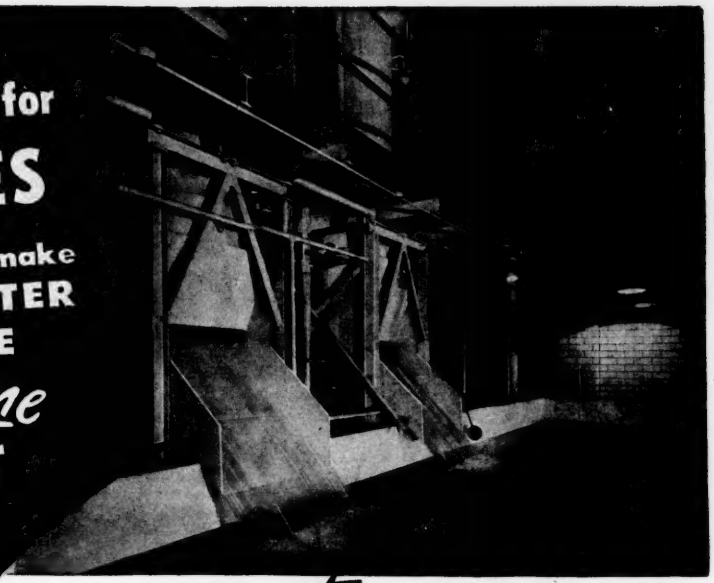
Prompt Deliveries!
Check Your Requirements now!

Represented on the West Coast by
Western Ice Equipment Company
420 Market Street, San Francisco 11, California

Jos. A. Martocello & Co. 229-231 NORTH 13th STREET PHILADELPHIA 7, PA.

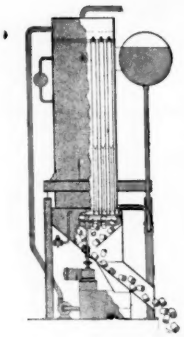
"Serving the Ice Industry Since 1916"..."There is no Substitute for **MARTOCELLO QUALITY"**

A "Natural" for
DAIRIES
Here's how to make
COLD WATER
and ICE
with One
UNIT



Vogt water cooling and ice making system provides cold water for latent heat water tank.

The Vogt Automatic TUBE-ICE MACHINE



HOW THE TUBE-ICE MACHINE FUNCTIONS

In making ice, water is pumped to the top of the freezer and flows downward along the inside walls of tubes into a water tank. Refrigerant in shell surrounds tubes and freezes water into cylinders of ice. An automatic timing mechanism operates suitable valves to control all functions of the machine. Ice is freed from the tubes by thawing when the refrigerant is displaced by high pressure warm gas from the compressor.

To cool water only the evaporating pressure is raised above that required for making ice.

Employing direct application of the refrigerant, all expense incidental to other systems is eliminated.

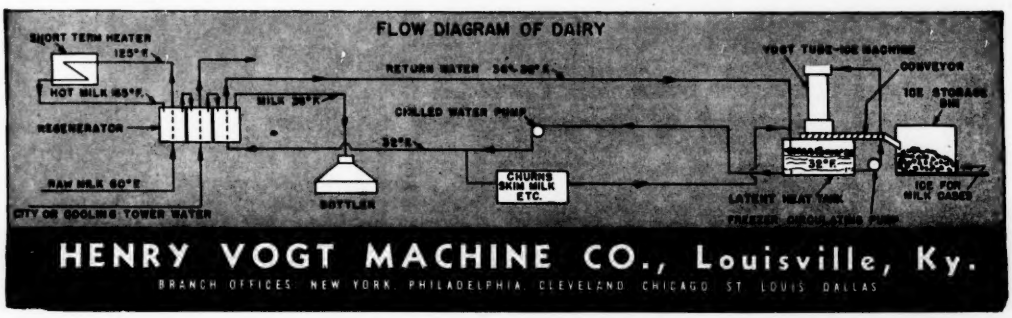
Patent Numbers 2,200,424, 2,239,234, 2,396,308. Other Patents Pend.

Dairies now get TWO essential services from ONE unit . . . Cold Water for processing milk and butter and, by a simple adjustment, sized Vogtice to guard the freshness and quality of all dairy products.

In the installation above two Vogt Automatic Tube-Ice Machine units make cold water during the day and Vogtice at night, thus utilizing refrigerating capacity around-the-clock. Thereby the refrigeration load demand is leveled out with a reduction in demand charges on electric energy, and the use factor of installed equipment approaches 100 percent. The stored ice acts as a flywheel by cooling make-up water to augment that made by the machine to provide ample cold water for process purposes.

Dairymen knowing the superiority of water for cooling can now install a modern Vogt system to provide both cold water and ice with a minimum of plant investment, power, and labor.

A flow diagram of the Vogt system in a dairy is shown below.



HENRY VOGT MACHINE CO., Louisville, Ky.

BRANCH OFFICES: NEW YORK, PHILADELPHIA, CLEVELAND, CHICAGO, ST. LOUIS, DALLAS

PALCO INSULATION WOOL

CUTS COSTS, SAVES PRODUCE

WITH THERMAL CONDUCTIVITY OF ONLY .255 BTU

Above: Daily capacities include quick freezing of 70 tons of produce, manufacture of 70 tons of ice at the recently enlarged Union Ice Company Plant at Santa Cruz, California. PALCO WOOL is the primary insulating material.

Right: Part of the 242,000 cu. ft. frozen food holding room area at the Santa Cruz Union Ice Company Plant, which also maintains storage rooms for 500 tons of ice and 600 frozen food lockers.

In ALL low temperature insulation, efficiency is the important factor in maintaining profits. Impartial tests and service records prove that PALCO WOOL is one of the most efficient insulations known. Made from naturally fire resistant Redwood bark, it is "Saferized" to make it permanently flame-proof. Moisture-resistant, non-settling, non-deteriorating, odorless, odor-proof, PALCO WOOL is the ideal low temperature insulation. Investigate before you insulate.

Write today for the PALCO WOOL COLD STORAGE MANUAL *or the* LOCKER PLANT PLAN *and* CONSTRUCTION MANUAL

FLAMEPROOF INSULATION FROM DURABLE REDWOOD BARK

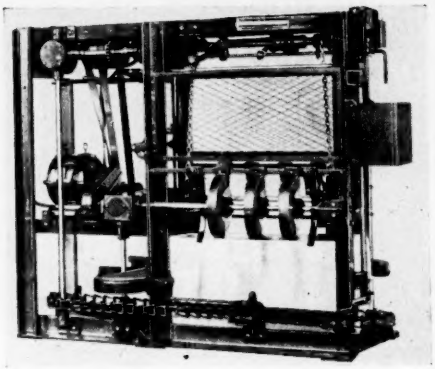
THE PACIFIC LUMBER COMPANY

100 BUSH STREET, SAN FRANCISCO 4, CALIFORNIA

5225 WILSHIRE BLVD. LOS ANGELES 36, CALIF. • 35 E. WACKER DRIVE, CHICAGO 1, ILL.

LOWEST PRICED

HEAVY-DUTY SCORING MACHINE



The Perfection made MILLER

Scoring Machine is the lowest priced, completely automatic, Heavy-Duty Ice Scoring Machine on the market. Hundreds of MILLER machines are in use all over the country and have been for many years.

Like all other Perfection products, the MILLER is sturdy, fast, economical in operation and maintenance.

IMMEDIATE DELIVERY!

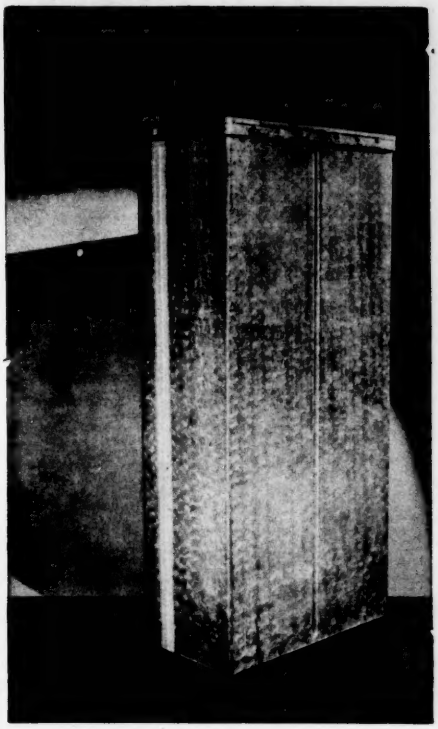
Perfection

ICE SCORING MACHINE COMPANY

Phone 3-1258
P.O. Box 2140
FORT WORTH, TEXAS

PROMPT SHIPMENT!

ICE CANS



WELDED OR RIVETED
LARGE OR SMALL

FOR: LOW PRESSURE
HIGH PRESSURE
ARCTIC POWNALL PLANTS

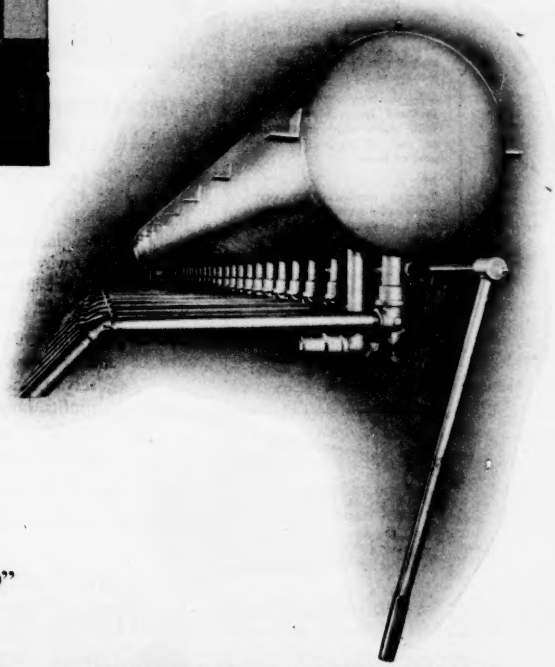
ALSO

CORE FILLERS
CORE SUCKERS
BRINE TESTING KITS
FISH FREEZING PANS
FISH FREEZER TRUCKS

ASK FOR
PRICE & DELIVERY

"BUILT STRONGER TO LAST LONGER"

CAN FILLER →



BUILT TO FILL ONE OR MORE CANS

ASSURES CLEAN WATER

MAY BE INSULATED

EASY TO INSTALL

SAME AMOUNT OF WATER AT EACH FILLING

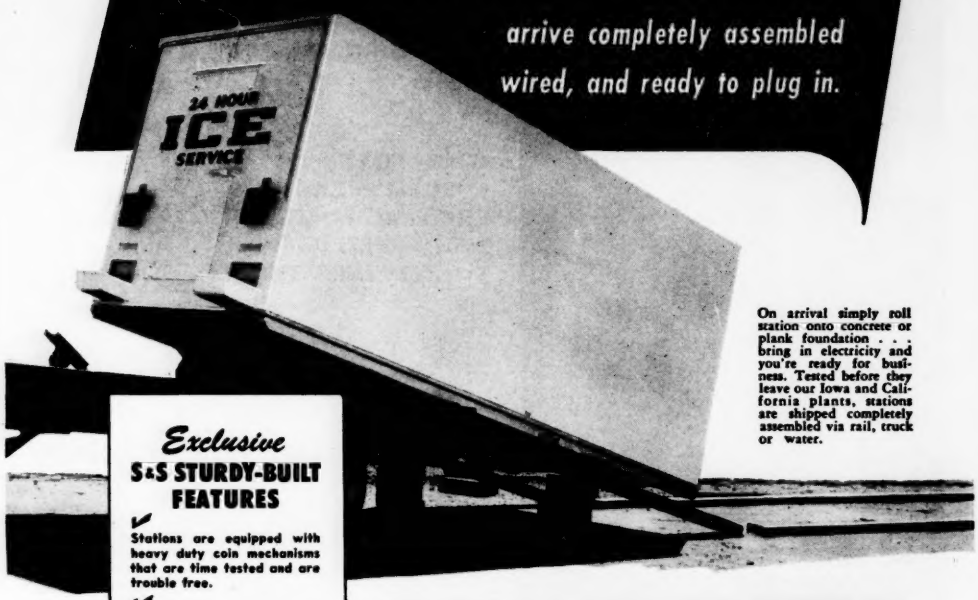
YOU CAN GET YOURS—NOW!

CABLE ADDRESS: "KNICKSTACO"

KNICKERBOCKER STAMPING COMPANY
PARKERSBURG, W. VA.

S&S STURDY-BUILT REFRIGERATED
ICE VENDING STATIONS

arrive completely assembled wired, and ready to plug in.



On arrival simply roll station onto concrete or plank foundation . . . bring in electricity and you're ready for business. Tested before they leave our Iowa and California plants, stations are shipped completely assembled via rail, truck or water.

Exclusive
S&S STURDY-BUILT FEATURES

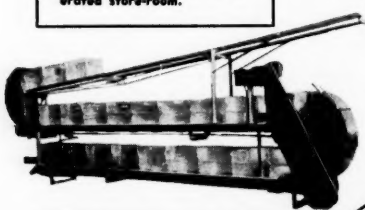
- Stations are equipped with heavy duty coin mechanisms that are time tested and are trouble free.
- Stations are equipped with time clocks that turn lights on and off automatically at proper times.
- Vending machines are rust-proofed by metallizing process which completely coats units with zinc to halt corrosion.
- Vending machines are equipped with counters to check unit sales with money deposited.
- Vending machines are completely assembled . . . ready to install in your own refrigerated store-room.

TIME-TESTED S&S STURDY-BUILT STATIONS ARE AVAILABLE WITH STEEL OR ALUMINUM EXTERIORS

In 1932 the first refrigerated ice vending station was delivered to an operator. After seventeen years of continuous operation it is still giving dependable, profitable service That's the kind of dependability that is engineered into every S & S Sturdy-Built Ice Vending Station. That's why, after seventeen years of service to the ice industry . . . "Time-Tested" S & S Sturdy-Built ice vending equipment leads the field.

Step up your sales and cut soaring distribution costs with refrigerated ice vending stations. Give your customers dependable 24 hour service, and watch profits rise. It'll pay out in *extra* profits. Look to S & S Sturdy-Built equipment for dependable, trouble-free operation . . . and lower costs per ton of ice handled.

For complete specifications and new low prices, write Dept.. I



ICE VENDING MACHINES

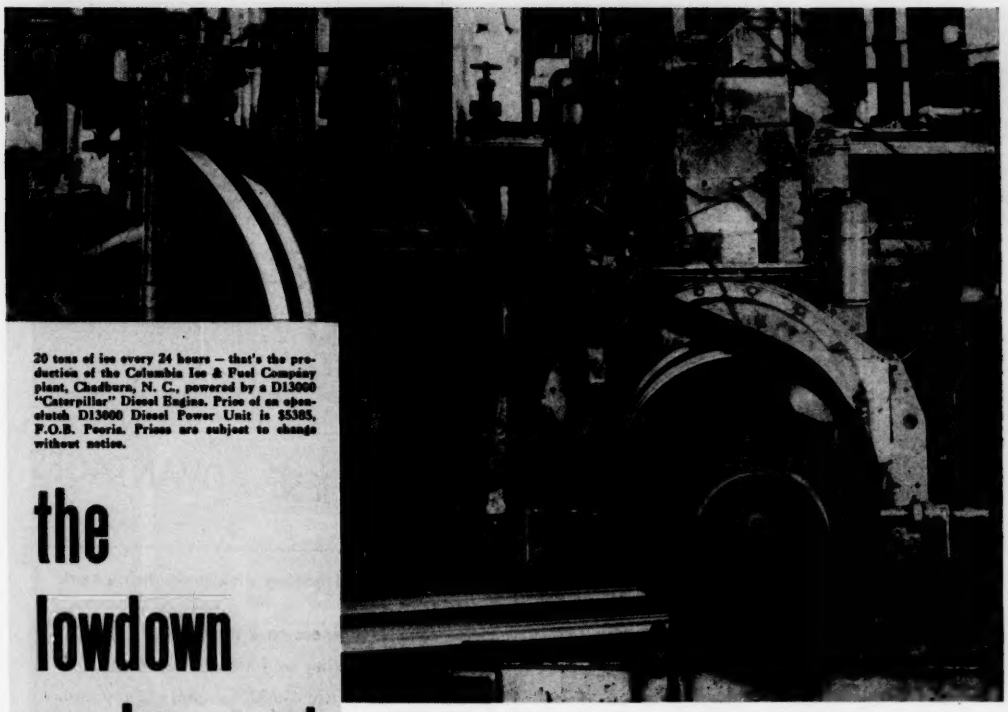
. . . for your own refrigerated storeroom are available for as little as $500.75. Completely assembled and all ready to plug in on arrival, S & S Sturdy Built venders will handle 25 or 50 lb. blocks. Other models are available to vend *cubes or processed ice* in bags weighing from 5 to 25 lbs.

REFRIGERATED STURDY-BUILT ICE VENDING STATIONS

F. B. DICKINSON & CO.
Highland Park Station
Des Moines, Iowa

S&S ICE VENDING MACHINES

S & S VENDING MACHINE CO.
870 Lincoln Avenue
San Jose, California



20 tons of ice every 24 hours – that's the production of the Columbia Ice & Fuel Company plant, Chadburn, N. C., powered by a D13000 "Caterpillar" Diesel Engine. Price of an open-clutch D13000 Diesel Power Unit is $5385, F.O.B. Peoria. Prices are subject to change without notice.

the lowdown on low-cost power

TWO important factors influenced the purchase of a second "Caterpillar" Diesel Engine by the Columbia Ice & Fuel Co., Chadburn, North Carolina. One factor—the dependable, trouble-free, low-cost operation of its first "Caterpillar" Engine, a D11000. The other factor – excellent service on the part of the "Caterpillar" dealer.

The second engine – the D13000 you see working here – has carried on with typical "Caterpillar" efficiency and economy. Running 8 hours a day, 30 days a month, all year round, it powers two 6½ x 6½ Vilter high-speed compressors, a deep well pump, agitators and other equipment. Average production every twenty-four hours: 20 tons of ice.

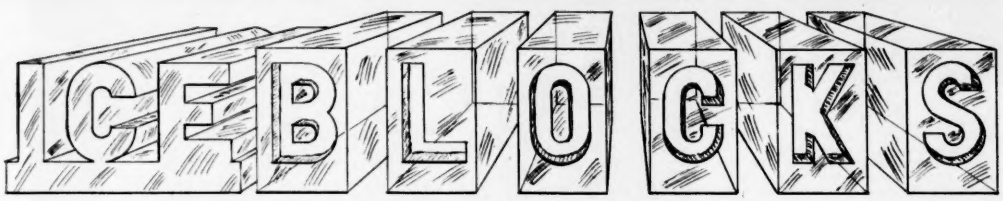
Dependable, low-cost power and prompt, capable service from your dealer – you can't beat a combination like that. And it's yours with a "Caterpillar" setup. Your "Caterpillar" dealer is as close as your phone. He can provide quick delivery of "Caterpillar" Diesel Engines and Electric Sets. It will be to your advantage to call him for information about them today!

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR
REG. U. S. PAT. OFF.
DIESEL ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

Templets THE *EFFECTIVE* METHOD OF TEMPERING RAW WATER ICE

REG. U. S. PAT. OFF.

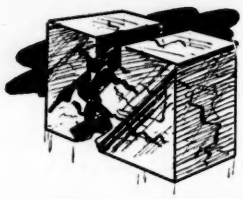


PRODUCED BY USING Templets OFFER THESE ADVANTAGES

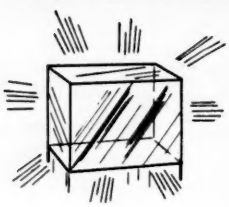
Freeze FASTER

Two or more Templets in each can of ice will produce that pleasing appearance and polish to your raw water ice.

Improve TEMPER



Have CLEAR ICE



1. **Permit faster freezing with lower brine tank temperatures.**
2. **Reduces cloudiness to a minimum.**
3. **Prevents cracking and improves temper.**
4. **Convenient to use—add Templets to the can, fill with water—that's all.**

Because TEMPLETS reduce the tendency of ice to crack and shatter, you can freeze faster with lower brine tank temperatures. Thus more ice can be produced in the same number of cans to meet the large demands of the summer season.

TEMPLETS dissolve quickly in the can water and go into action immediately to prevent the development of strain which produces brittle ice that is so difficult to handle. TEMPLETS temper the ice and give it strength against bothersome bad breaks during scoring and cutting operations.

Users want clear ice with a clean attractive sparkle and polish. TEMPLETS aid you in eliminating the cloudy veil, white butts and heavy cores which impair clarity of the ice block and any sized ice made from it, all of which means more profit for you at a cost of about 1c per ton of ice produced.

TEMPLETS are being used in Ice Plants throughout the United States and in many Foreign Countries.

Write today for details and a trial sample. Your customers will thank you.

BARADA & PAGE, Inc.

GUINOTTE and MICHIGAN AVES.

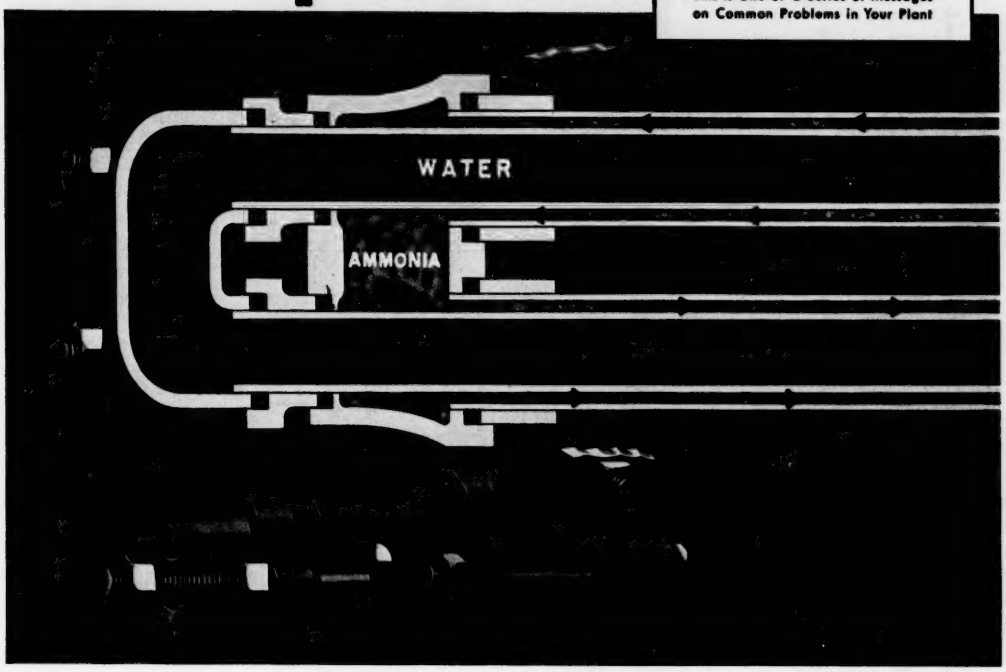
Kansas City 1 **Missouri**

No Standing Room for Deposits!

Inside Knowledge on Lubrication Problems

—CONDENSER DEPOSITS—

This is One of a Series of Messages on Common Problems in Your Plant



In double-pipe condensers like this, it's doubly important to guard against deposits that may form from unsuitable oil carried over from the compressor.

The space between the inner and outer pipes, through which the refrigerant circulates, is comparatively narrow. Films of decomposed oil or gummy deposits can easily restrict circulation. Even thin films, by acting as insulators, will reduce heat transfer, increase head pressure and lower the efficiency of the whole system.

You get maximum protection against these troubles when you use Gargoyle Arctic Oils. They have unusual stability and thus resist the formation of deposits due to deterioration. Moreover, their high lubricating qualities mean that they can be fed sparingly, yet keep compressors operating efficiently with minimum wear.

Get these proved oils in your refrigerating system now!

GARGOYLE Lubricants

SOCONY-VACUUM

SOCONY-VACUUM OIL CO., INC.
and Affiliates:
MAGNOLIA PETROLEUM CO.
GENERAL PETROLEUM CORP.

Socony-Vacuum Correct Lubrication

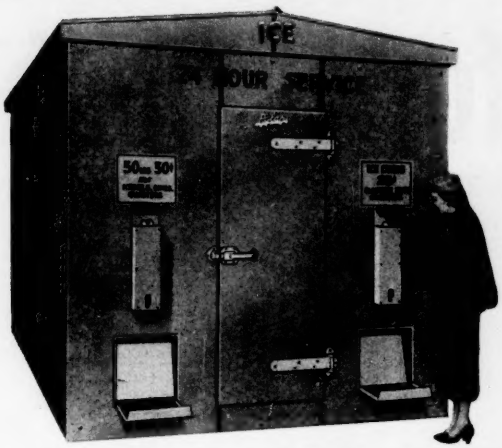
FOR EVERY MACHINE... EVERY OPERATING CONDITION

POLAR *ICE VENDING STATIONS*

Setting The Pace...
Leading The Field!

1 *st.* { **Aircraft Aluminum Construction**

with { **Coin Mechanism That Adds Change**



Look First to Polar for Revolutionary Improvements in Methods of Merchandising Ice

Think First of Polar When Ordering Your Vending Equipment

Check the Complete Polar Line — *NOW!*

THERE'S Extra Value IN POLAR EQUIPMENT

LIGHT WEIGHT CONSTRUCTION! The aircraft aluminum used in POLAR Stations is heavy gauge for durability, yet extremely light in weight. The sectional stations can easily be transported to the desired location on an ordinary truck. NO CITY PERMIT REQUIRED.

The ease with which the light weight sections can be handled makes it possible for 3 men to completely erect the largest size POLAR station in less than five hours!

We can supply POLAR stations completely set up on skids. However, POLAR STATIONS, SHIPPED KNOCKED DOWN, ARE EASIER TO HANDLE, SAVE ON FREIGHT COSTS, AND LESSEN POSSIBILITY OF DAMAGE IN SHIPMENT. On orders for $5,000.00 or more, our engineer assists with installation.

ECONOMICAL OPERATION! POLAR ALUMINUM ICE STATIONS ARE HEAVILY INSULATED AND EQUIPPED WITH SURPLUS POWER REFRIGERATION UNITS. They will always maintain proper temperatures at the lowest possible cost. Aluminum repels 97% of radiant heat.

LOW UPKEEP! ATTRACTIVE APPEARANCE! There is no maintenance cost involved with POLAR stations for the aluminum does not require paint. The stations are trimmed with chrome, coin boxes are stainless steel, and the hardware and ice chutes are cadmium plated. The attractive appearance of POLAR aluminum stations permanently improves any location where they are installed!

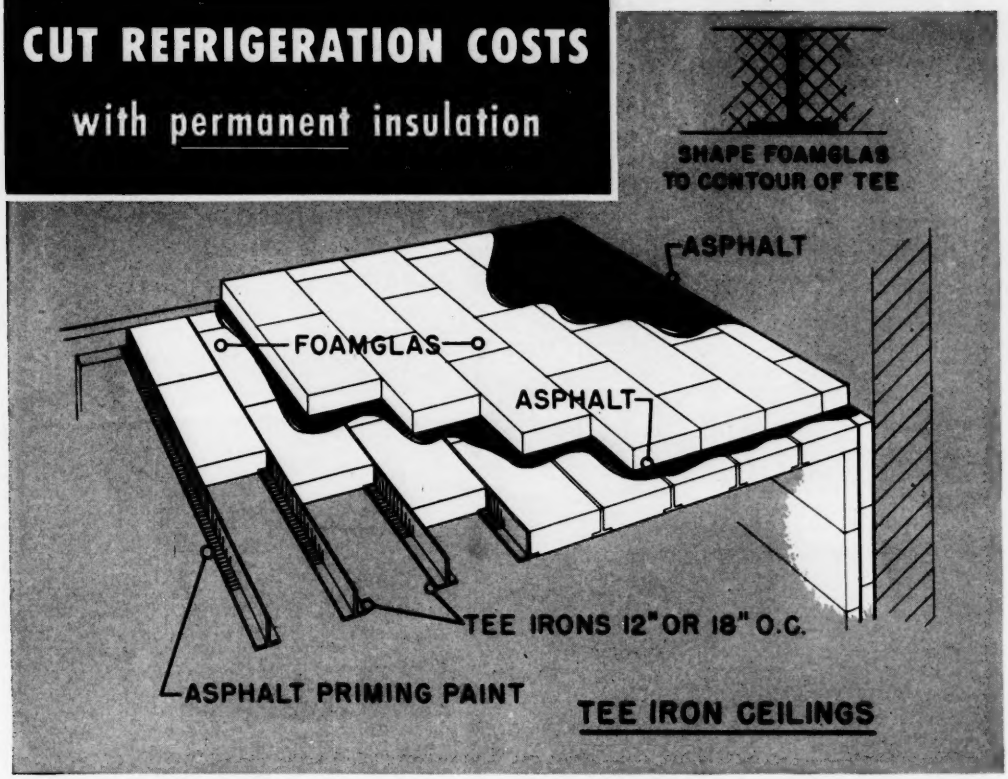
Polar Equipment Helps You SELL MORE ICE -*Automatically!*

Write Today for Free Polar Catalog

REFRIGERATION ENGINEERING COMPANY

211 Foshay Tower *"Pioneers in Refrigeration"* **Minneapolis 2, Minn.**

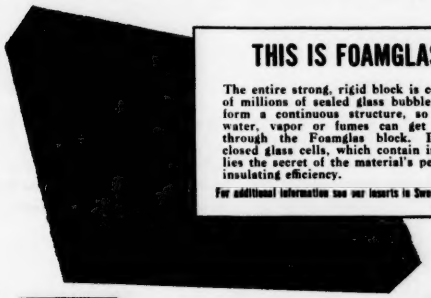
CUT REFRIGERATION COSTS
with permanent insulation



● It takes a mighty rugged material to do a permanent insulating job in refrigerated structures. Organic, fibrous and granular materials often ice up, pack down, rot, shrink or swell, causing costly operating failures, repairs and replacements that send refrigeration costs to new highs.

But PC Foamglas—because it is a true glass in cellular form—retains its original insulating efficiency permanently—when properly installed. It is frostproof, vaporproof, fireproof, acidproof and verminproof. In walls, floors and roofs, Foamglas has proved—over the years—its ability to retard heat travel, to help maintain desired temperatures in refrigerated space.

When you have insulation on your mind, remember, with PC Foamglas, your first cost is your last cost. You can easily learn more about this effective, economical material by sending for our free booklet. Just send in the convenient coupon and your copy will be mailed at once.



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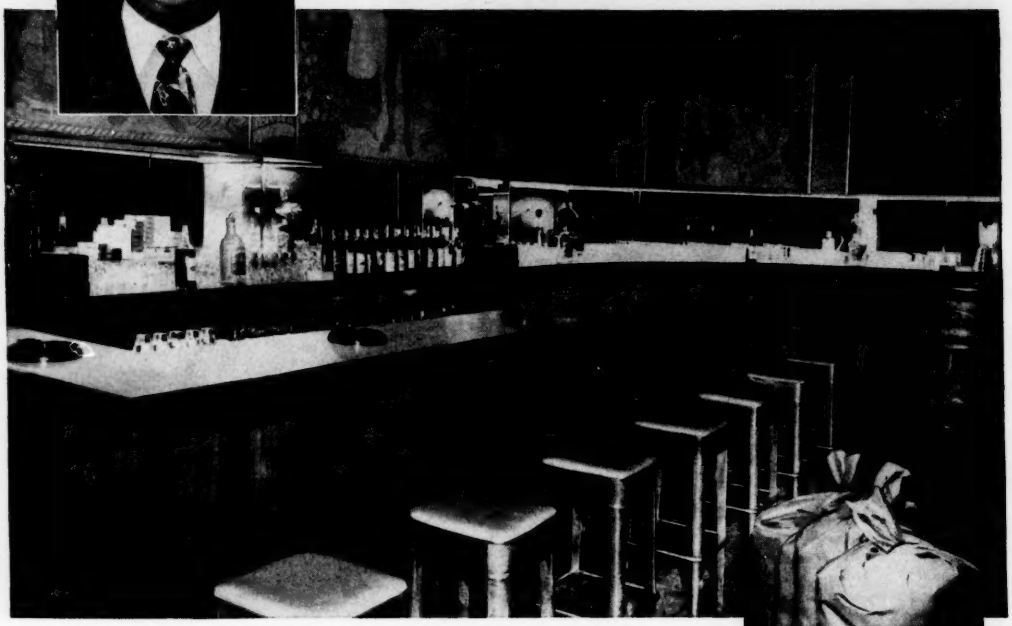

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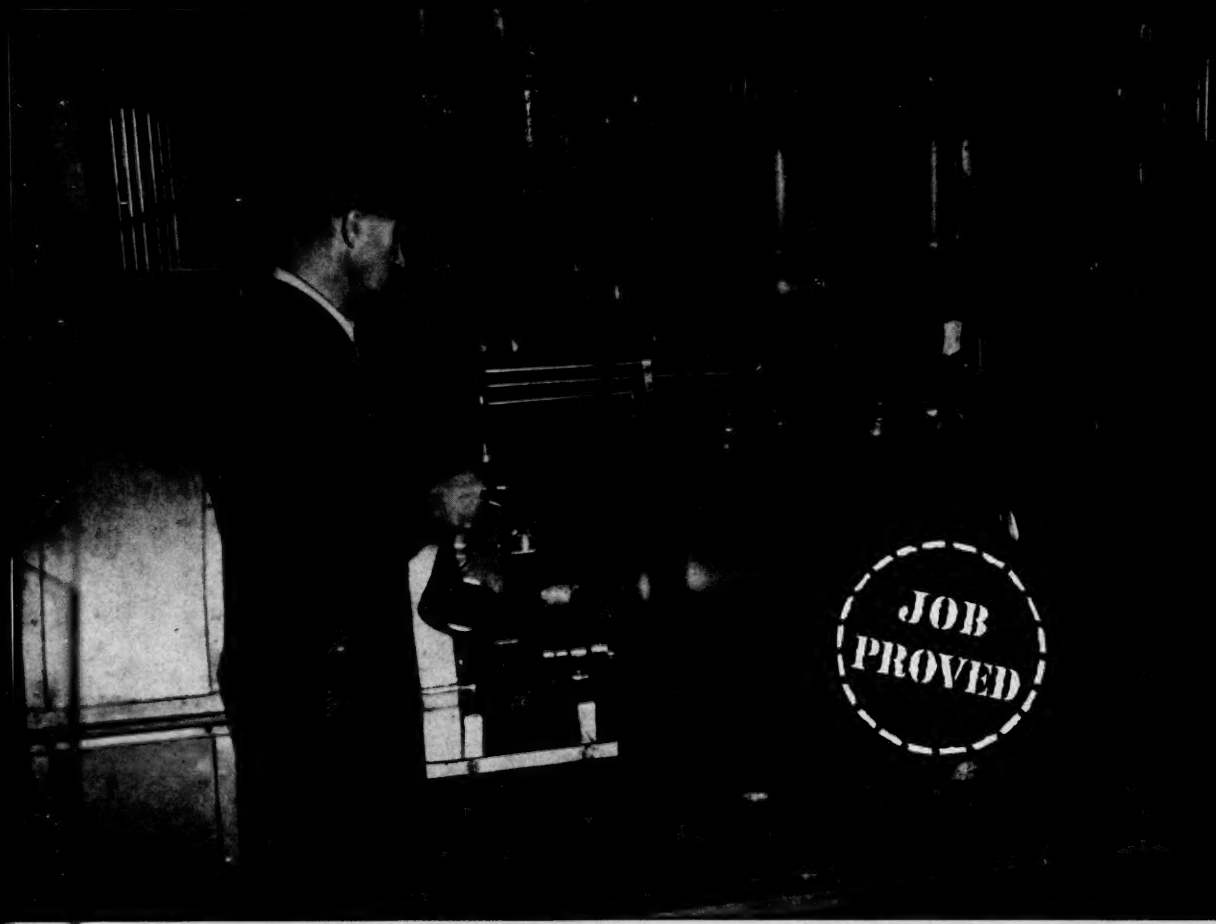

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ICE AND Refrigeration

J. F. NICKERSON, Founder

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IN THIS ISSUE —

Machine Setting and Adjustment

Much better and more reliable operation can be expected from a compressor or engine set on an adequate foundation, properly assembled and leveled. When machine parts wear unduly or heavy parts break, the trouble may result from the fact that the machine was not properly leveled or lined up. On page 25 W. R. Pender reviews some of the fundamentals and describes instruments designed to aid in proper machine setting and adjustment.

Save Money in Plant Operation

The article on page 29 by Robert Brizzolara is somewhat like a conducted tour through a plant in which an expert points out the sources of potential operating improvement. Present methods are analyzed and methods of improvement are suggested. For instance operators are urged to study their operations on a unit cost basis and interesting data is given from several plants to show production per man-hour. All of it will interest the men who wish to raise their plants to a higher level of operation.

New Type Absorption System

A new type of absorption refrigerating system which employs water as the refrigerant and a salt solution as the absorbent has been applied to a number of air conditioning jobs by Carrier Corp. which developed it. The details of this interesting new machine have recently been announced. The article on page 33 tells how the system operates and shows one of the installations.

Elevators for Fork Trucks and Mechanized Equipment

The capacity of an elevator is not the only consideration when thought is given to its use with power truck equipment. Fork trucks for instance carry heavy loads and most of the total weight of truck and its load is concentrated on the two front wheels. Speed of travel, starts and stops are increased with resulting enlargement of the impact and stress on the elevator and component structure. New elevator designs to meet the requirements of this service are described on page 39 by Joseph Mastroberte.

The Automatic Ice Cuber

The competition of automatic ice cubers has been concerning the ice industry for many months and this is felt particularly in sections where the ice industry has done a good selling job. At the recent California ice convention a discussion of this subject was presented calling attention to the situation and making suggestions as to how it might be met. This discussion is summarized on page 43.

Addled Egg Program

It looks like another bad year for egg consumers. Much egg storage space remains empty while the government inflation program removes eggs from the market, page 37. Perhaps this year will repeat the mistakes of 1947 and the egg industry as well as its associated activities will suffer long range losses.

Recirculation System Runs on Internal Energy

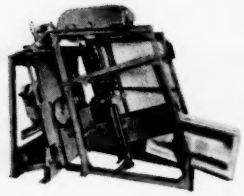
Spurred by high costs of coils and other evaporator surfaces, the trend to more effective flooding systems has been accelerated. The use of refrigerant liquid pumps has increased. At the same time really positive separation of liquid from the suction gas has been arranged. It is needed to protect recent high speed compressors. A system which recirculated liquid refrigerant with power from its flash gas is described on page 53 by J. E. Watkins.

No Agreement on Freezer Storage Refrigeration Methods

Has any agreement developed in regard to methods of refrigerating freezer storage rooms? That was the question a member asked Prof. Venemann in the NAPRE Question Box. The conductor of this widely read column passed the question along to a number of capable engineers. No agreement, sharp difference of opinion resulted. Read the reports on page 56.

Frozen Fruit and Vegetable Pack

The annual report on packs of frozen fruits and vegetables has been issued by the National Association of Frozen Food Packers. It shows an increase for 1948 over the previous year for both fruits and vegetables with a particularly marked increase for green and wax beans and strawberries. Summary of the report is published on page 64.



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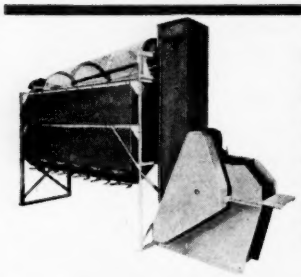

SERIES S-16 ICE SIZING UNIT—Combines Breaker-Elevator Unit S-16E and the new G-W 620 Precision Breaker with screen and bagging bin assembly. Four types meet varied requirements in elevator heights and bin capacities, assuring full production capacity and bagging output. Write for Bulletin No. 482.

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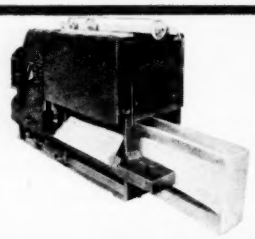

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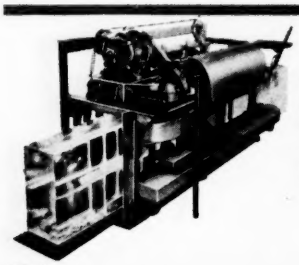

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Installation and Checking of Large Size Compressors and Engines

By W. R. Pender
A. M. Lockett & Co. Ltd., New Orleans

FOR successful installation and low cost operation of large machines the foundation should be stable, the machine should be firmly held in place and it should be aligned accurately. This discussion embraces various factors in the subject and describes equipment and methods designed to facilitate proper installation of large machines. First let us review some of the basic points of foundations.

Basic Points

The foundation is very important when machinery is of large size requiring heavy supports. As a general rule manufacturers furnish plans for the foundation and lay-out showing machine foundation bolts and other accessories. Unless specified the manufacturers are not responsible for local sub-soil characteristics. Therefore the purchaser must make investigations and consider the effect of the weight of the foundation and the compressors or engines, so as to make the installation secure to prevent future settling and misalignment. Thereby he takes the first step to prevent costly maintenance and insure continued operation.

Extracted from a paper presented to New Orleans Chapter, NAPRE.

In some installations vibration of the machinery in itself and the transmittal of vibration to other machines or to the building is of vital importance. I have assisted in several installations requiring the compressors to be supported by heavy springs under the foundation of the machine. The sub-foundation on which the springs rested was installed in the ground. The heavy springs effectively dampened the vibration and prevented the vibration from affecting the main building. A vault type foundation, lined with isolation cork is very effective, where vibration must be taken in consideration to prevent future trouble with the machines.

Where the sub-surface is such that the weight of machine and foundation cannot be carried without settling various methods are used to reinforce the standard foundation, probably driving of wood, concrete or steel piling. Should the sub-soil justify a less expensive foundation, a broader sub-foundation or reinforced concrete mat which has a greater bearing area is feasible to install.

The foundation bolts holding the machine to the foundation, must be installed in the foundation, so as to provide a space two inches larger in diameter than the bolt. This is usually done by placing a 2 in. larger pipe or tin cylinder around the bolt. It is necessary to provide movement of the machine when aligning and leveling during installation and for matching the bolt holes in the machine.

Fig. 1—Combination gage used in checking machine assembly and setting.

Fig. 3—Inside micrometer with special magnetic base which assists in making true measurements for machine adjustments.

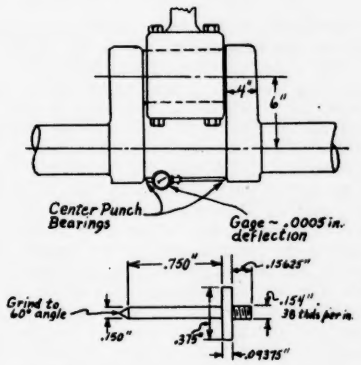


Fig. 2—Details of the adaptor pin which connects the strain gage and the inside micrometer.
Above is sketch of a crank shaft with the gage in place with typical dimensions and reading given.

Usually the larger size compressors, which require dismantling before shipping, have to be reassembled and installed on foundations, which have been previously constructed. Before placing the main bed plate on the concrete foundation, be sure that the top of the foundation is cleaned and roughened sufficiently to permit the "grouting" to be mechanically bonded to the concrete. The foundation must be so designed to leave a one and half inch space between the machine base and the top of the concrete. The bottom of the compressor or engine must be at least one inch above the surrounding floor level, this is very necessary to prevent waste oil and water from entering underneath the bottom of the base. Serious damage has resulted to the foundation due to water and especially oil seeping in between the base and the foundation.

Setting and Leveling

Place temporary shims either flat or leveling wedges underneath the base of the machine and level the machine and align with other shafts or driving equipment. If a small amount of grease is placed between the two top shims, the base can be moved easily as required in align-

ment. After machine is level and almost completely in alignment, the final adjustment can be made to place the machine in perfect operating condition. To do this various methods are used, one which is required by insurance and underwriter companies, is the testing of the crank shaft for strain or distortion, by using a special micrometer.

The writer has developed a method which is to combine two well known instruments into one which is more effective and easy to use. The new method also provides a double check on the accuracy of the Dial Micrometer, also providing a method whereby the correct tension can be applied accurately and positively, thus aiding and perfecting the Strain Gage or Distortion Gage.

The gage shown in Fig. 1 is a combination of a Starrett No. 696 crank shaft strain gage and a Starrett No. 124 inside micrometer. The details of the adapter pin used to connect them are shown in Fig. 2 with a diagram of the method used to set the gage in place. This is accomplished as follows:

At the extreme outer edge of the web of crank, lay off punch marks at center line. Set marks to V shape, 1/16 in. depth. Select proper length of extension shafts to give approximate midway adjustment of the micrometer. Put the gage in place between the punch marks and adjust the micrometer to put tension on the dial gage of about 0.020. Excess tension or insufficient tension affects readings.

Spin the gage between centers until the indicator does not move from "zero". Check the Dial Gage by adjustment of the micrometer—0.001 in. on the micrometer should indicate the same amount on the Dial Gage. Turn crank to obtain measurements at top, sides and bottom of stroke, note each on record. Always read dial when placed at same relative position of crank. Use magnifier mirror and light to read gage in obscure positions.

The most effective use of the Strain Gage is obtained during the installation of the Diesel, gas or steam engines, and compressors. Faulty leveling affects the crank shaft. The outside drive to which the engine is connected can be effectively aligned with the engine to within one quarter of one thousandth of one inch. Heavy flywheels, generators, etc., deflect the main shaft unless compensated by proper leveling and alignment.

The empirical formula used to check the stress is:

$$\text{Stress in lb. per sq. in.} = \frac{43{,}450\ w\ d}{(S/2)^2} \text{ where:}$$

w = thickness of web
d = deflection in thousandths of one inch
s = stroke, inches

Refer to the sketch, Fig. 2, as a typical example on which the dimensions are shown.

$$\text{Stress} = \frac{43{,}500 \times 4 \times 0.5}{6 \times 6} = 2400 \text{ lbs. per sq. in.}$$

This is safe because the danger point is 20,000 lbs. stress and since the gage is placed beyond the center line of the shaft there is an additional factor of safety.

Another improved instrument developed by the writer is shown in Fig. 3. This is a base made to fit the Starrett No. 124 micrometer. It facilitates the use of this inside micrometer to adjust piston rods, cross heads, crank shafts, frames and main bearings. The base is magnetic and the details of construction are shown in Fig. 4.

The advantage of using the base on compressor and engine alignment, is in having the micrometer square with the work. The unit as a whole is easy to use and requires less skill in obtaining the measurements, which are required to be within .0005 in. for perfect alignment of compressors and engines. The micrometer can be removed from the base and used on other work. The special base can also be used to hold other instruments. The base can be made in magnetic metal which will hold the assembly on the work or a non magnetic type can be used.

This discussion deals principally with the setting and adjustment of new machines but those already in place are not always found to be accurately aligned and set. If there is any doubt it is always well to check them for inaccuracies. Excessive wear on parts and other defects in operation may be indicators of faulty setting or adjustment of the machine.

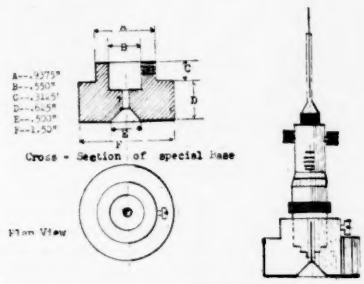


Fig. 4—Details of the special base attached to inside micrometer to facilitate its use in machine adjustment.

For instance in a double acting horizontal cross-head compressor or engine the piston rod must travel in a true horizontal plane or the rod packing will wear excessively and undue strains will be developed. Because the cylinder is somewhat larger than the piston, it is a mistake to assume that the piston runs in the exact center of the cylinder. Actually it travels in a line somewhat below center. If the cross-head is set in this exact center the result is that the piston rod travels in a slightly inclined plane, probably riding on the packing during part of the stroke. Obviously the correct method of leveling and aligning the compressor would be to adjust the cross-head and piston rod to travel slightly below center so the latter would reciprocate in an exactly straight line. The micrometer base described before is very useful in making such adjustments on an accurate basis.

Grouting and Final Setting

After the machine is correctly leveled and aligned, the space between the base and the top of the concrete must be filled with a mixture of sand and cement or any approved grouting material. I have found over a period of many years, that a mixture of two parts of clean sharp grain sand and one part of Portland Cement, mixed with water to the proper consistency for free flowing, is the best material, but the mixing and application must be made in the correct method, otherwise the results will be poor. The "grouting" is such an apparently simple process, that it is often neglected and the job given to someone not well versed in the requirements. If we consider the extensive work and design done on the foundation and the cost of the machine, it is apparent that all can be lost if the final setting and grouting of the machine is neglected.

First the bolt holes should be filled. Then the grouting forms should be placed with provision for a 6 in. head of grout above the base to insure full flow under the base. Eight hours after pouring the excess grout should be removed from the outside of base. After one week, remove temporary support shims and finish the top of the foundation so that it slopes away from the machine to prevent water and oil from running under the base.

Standardized, Up-to-Date Codes Benefit Everyone

A NUMBER of cities in recent years have adopted new refrigeration construction codes or regulations. Others have revised their ordinances previously established. Certainly it is of benefit to both plant owners and the public to have adequate and modern regulations of this nature but there are numerous problems involved.

Because of the costly restrictions suffered by many industries from out-of-date and nonuniform local regulations, a committee of the American Standards Association is issuing an analysis of the question "How can nationally recognized standards legally be used in state laws and local ordinances?" The committee has come to no decision and is making no recommendations but hopes that the booklet will bring comments and suggestions that may help to solve the problem. Every industry or group that has found its business hampered by varying local requirements and by regulations that make it necessary to supply out-of-date or nonstandard materials will be interested in studying the suggestions offered by the group of experts. They are invited to send their comments to the American Standards Association.

Four principal papers are included in the booklet, "Nationally Recognized Standards in State Laws and Local Ordinances." They show how lack of uniformity in technical requirements increases costs to industry and to the public, and reduces public safety. They analyze the need for legal methods that will permit widespread use of nationally recognized standards; summarize the present status of the "adoption by reference" method; and discuss the legality of several methods that have been followed in using national codes and standards as a basis for local regulations. Titles and authors of the papers listed in the booklet are:

Papers Discuss Problems

Economic Effects of Lack of Uniformity of Acceptance of Nationally Recognized Codes and Standards (on Manufacturers of Building Materials and Equipment, on Distributors, and on Industrial and Commercial Users). By F. Stuart Fitzpatrick, manager of the Construction and Civic Development Department, Chamber of Commerce of the U. S.

Effects on the General Public, on Public and Private Building Agencies, and on the Home Owner of Lack of Uniformity of Acceptance of Nationally Recognized Codes and Standards. By Leonard G. Haeger, Director, Technical Staff, Housing & Home Finance Agency.

Municipal Adoption of Codes by Reference. By Roy H. Owsley, Associate Director, American Municipal Association.

The Constitutional and Legal Problems Surrounding the Use of National Codes and Standards by States and Municipalities. By R. R. Irvine, Donovan, Leisure, Newton, Lumbard & Irvine, New York.

In addition to the four principal papers, excerpts are included from several model statutes and ordinances proposed by organizations that have been working on the problem. The National Electrical Manufacturers Association, the National Institute of Municipal Law Officers, the Pacific Coast Building Officials Conference, and the Council of State Governments have all made proposals on the subject.

Effect on Manufacturers

"A manufacturer who seeks wide distribution of his products is materially affected by the legal requirements his products must satisfy throughout his market area," Mr. Fitzpatrick explains in describing the economic effect of lack of uniform acceptance of nationally recognized standards. If state and local requirements are relatively uniform, he says, a manufacturer can produce for a mass market and can thus enjoy the benefits of simplification and standardization. However, if local requirements vary to a considerable degree, he must diversify his output and produce each item in smaller quantity, often at higher cost.

He may even find himself shut out of some localities where codes prohibit the use of certain materials or methods, as is the case in some instances with welding, plywood, light-gage steel, armored cable, and light-weight aggregates. The National Electrical Code is an outstanding example of one of the nationally recognized standards that have been generally adopted throughout the United States, Mr. Fitzpatrick points out. Since at the present time there is no way legally to adopt future editions of a national standard in a state law or local ordinance, there is still no solution to the problem of keeping the local codes up to date with changes which are made from time to time in a national code.

As one example of how expensive it can be to industry when a local government puts into effect special requirements not in accordance with a nationally recognized standard, Mr. Fitzpatrick cites a charge of some $30,000 for an installation not required by the National Electrical Code in one case where a local ordinance did not recognize the provisions of the Code.

Obsolete Building Requirements

Obsolete building regulations are of prime importance as far as the public is concerned, declares Mr. Haeger. Not only do they restrict the use of new materials and methods of construction but they endanger the public, as evidenced in recent hotel disasters. The fact that many state and local building codes do not reflect up-to-date engineering knowledge prevents more economical use of materials. As a result, materials and labor going into the construction cost are increased without increasing the efficiency or safety of the structure.

In many communities prefabricated houses cannot be erected because they do not conform to traditional practice even though they have met recognized tests for stability and strength. Lack of uniform requirements in plumbing codes has caused variations of as much as 150 per cent in requirements for sizing of pipes. These variations cause producers to manufacture many different sizes and distributors to carry a heavy inventory. Mr. Haeger declares that estimates show that an average saving of $50 per dwelling would be possible in an average community if the plumbing were designed according to the requirements of a uniform plumbing code.

Cost of Publishing Codes

The requirement by many states that municipal ordinances must be published in a newspaper or other public document has frequently caused cities to adopt incomplete

and unsatisfactory building and safety codes. Mr. Owsley in his paper quotes some figures from a 1947 issue of the Denver Post: "It costs a city $2,239, and a town $1,343, to take advantage of the Uniform Pacific Coast Building Code; a city pays $1,237, and a town pays $742, to publish the United States Milk Code; a city pays $364, and a town pays $218, to publish the Model Traffic Code on Street and Highway Safety; a city pays $831, and a town $498, to publish the Fire Prevention Code printed by the National Board of Fire underwriters; and a city pays $4,792, and a town $2,875, to publish the Flammable Liquids Code recommended by the National Board of Fire Underwriters." The paper comments, "These costs seem unreasonable to the town receiving only $800 a year from tax sources."

Adopting Standards by Reference

Because of this cost, legislatures of 15 states have passed enabling acts authorizing municipalities to adopt codes by reference, although some of these 15 restrict the type of standards that can be adopted in this way. In cases where standards are adopted as part of an ordinance without publication in a local newspaper, copies of the code must be filed in a public office so that they will be readily available to the public.

Mr. Owsley gives a careful analysis of the variations that exist in the practice of adopting a standard by reference. In every case, he points out, reference must be to a particular edition of a standard or code and cannot in any case authorize the adoption of future editions. This has not only been specified in many of the state enabling acts but also has been laid down in court decisions whenever the question has come up. Despite the wide recognition of the procedure of adopting a standard by reference, the courts in some states have handed down decisions that seem to rule against the procedures in those states.

Mr. Owsley concludes, "The considerations, coupled with the fact that existing publication requirements in some jurisdictions constitute an extremely serious deterrent to local adoption of the numerous excellent technical codes developed by nationally recognized experts in their respective fields, make a strong case for the early legislation of the adoption by reference procedure in all states."

Mr. Irvine emphasizes the fact that the movement to enable municipalities in all states to adopt codes and standards by reference is growing. But, he points out, this method does not help to keep state and local regulations up to date with new developments since court decisions have established the policy that no state or municipality can legally adopt by reference future editions of a code. Therefore, in order to put new editions into effect the law or ordinance in which they are mentioned must be revised. And experience shows that this is not done frequently enough to keep them up to date. Mr. Irvine points to the fact that the 1897 edition of the National Electrical Code is still in force in one Ohio town.

Prima Facie Provision

As an alternative, Mr. Irvine suggests a different approach. This would make compliance with a national standard prima facie evidence that the requirements of the law had been met. By this method an ordinance or statute would require that a standard of duty established by the legislative body shall be met—for example, installations of electrical equipment shall be "reasonably safe" to persons and property. It then would declare that compliance with the requirements of the National Electrical Code, for example, shall be prima facie evidence that the installation is "reasonably safe to persons and property." By this method the requirement always remains the same whereas the methods or materials used in making the condition "reasonably safe" may change with changes in technical developments.

In Mr. Irvine's opinion this type of provision will pass constitutional and common law tests, and the prima facie provision would have the additional advantage of making codes and standards admissible in evidence. To make sure that such a statute cannot be open to attack, however, Mr. Irvine suggests it should include the reasons why the legislative body chose that particular code as authoritative basis for frima facie evidence.

He suggests that a statement of the "impartial nature and recognized authority of the associations sponsoring the code or standard" and a description of the "all party in interest procedure which leads to approval by the American Standards Association" would provide a firm basis in authority and impartiality for use of the code or standard. As a result, the statute or ordinance could then be attacked as an arbitrary use of its power by the legislative body, in his opinion.

The booklet, "Nationally Recognized Standards in State Laws and Local Ordinances," is a report by ASA Committee Z56 on Model Laws and Ordinances. This committee is engaged in a study of procedures whereby the use of nationally recognized standards and their latest revisions may be put into effect in state laws and local ordinances for the purpose of promoting uniformity of technical requirements throughout the country. Copies of the booklet are available from the American Standards Association, 70 East 45th Street, New York 17, N. Y.

Comments and suggestions received as a result of publication of this report will be used by the committee in preparing its final recommendations.

Russian Society Honors Zarotschenzeff

THE Russian Theatrical Society on May 7, 1949, presented a program at the Troupers' Club, Hollywood, Calif., to congratulate and felicitate M. T. Zarotschenzeff, well-known as a refrigerating engineer who has done much work in frozen food research. That day marked three milestones in Mr. "Z's" life: his seventieth birthday, fifty years of business activity, and forty years devoted to pioneering in refrigeration and quick freezing of food products.

Mr. Zarotschenzeff was born in South Russia, studied railway engineering at the Railway Institute at Moscow and further engineering studies at the College of Commerce, Moscow. The first modern cold storage in Russia was built in Moscow in 1911 under his direction. This plant is still operating.

Quick frozen foods which are well known today were produced by Mr. Zarotschenzeff in 1913 on an expedition to Lake Goache on a mountain level of 12,000 ft. near Mt. Ararat. During World War I, he organized and constructed some 17 meat packing and cold storage plants for the Russian government. During the revolution of 1917-18, he and his family left Russia, moving first to France and then to England, and in 1931 came to the United States, at which time he became an American citizen.

The year 1930 marked the development of his special process of quick freezing which became known as the "Z" process. He and his son organized the American Z Corp., which later became known as the "Z Pack Corp." This finally culminated in the organization of the National Frosted Foods, Inc. in 1938. This company is quite active under the management of his son, W. M. Zarotschenzeff who, during the past twenty years, has paralleled the refrigeration activities of his father.

How to Economize in Plant Operation

By R. T. Brizzolara,

Consulting Engineer, New York City

I HAVE been invited to speak on the subject of "How to Economize in Plant Operation," a very wide topic. The handicaps to securing it come under various classifications, including management, labor, machinery and—consulting engineers. I will confine my remarks mostly to machinery —and avoid engineers entirely.

Under a classification about which something can be done is that of electric power consumption. Wisely this is usually purchased, for its manufacture is another business beset with its own problems. To purchase as little of it as possible is your business. The major consumption of this purchased power is utilized for ammonia compressors—75 to 80 per cent of it. To keep it low, a plant must be operated at as high a back pressure or suction as possible. For 11 F brine the back pressure should not be less than 20 lbs. For 14 F brine the back pressure should not be less than 24 lbs. Every lb. change in back pressure is a matter of 3.5 per cent in power consumption. Every lb. reduction in discharge pressure is a savings of about .7 of 1 per cent. There is hardly a plant any of you possess that cannot reduce its head pressure 10 to 25 lbs. by merely purging your condensers properly and cleaning them.

Higher back pressures can be secured by employing better surfaced coolers, of course, but without this capital expenditure, better agitation, removal of oil from the evaporators and proper flooding with ammonia will prove a revelation in most plants.

Water Expense

An ever increasing expense in most plants is that for city water. Roughly, for easy remembering, the water consumption in a plant should be about the same cu. ft. per ton as the KW Hrs. of power consumed per ton of ice. Excess water consumption is mainly attributable to waste. These wastes are usually found in the use of excessive water for hot gas water heaters, compressor jackets, the dip tanks and plain leakage. Points of leakage are usually found associated with float valves in ice can fillers, in cooling pond make up float valves and leakage in 3 way cocks operating ice can dumps. Many city water stop valves, both of the gate and globe type, will be found leaking through after several years of service.

Jacket water from compressors should be around 100 to 110 F.

Water wastes can occur around filters, valves not tight and to excessive backwashing. Back washing is best done with a differential pressure of 10 lbs. between in and out. Excessive use of alum fouls up the sand in a filter and makes for red and brown cores. Excessive back washing does not accomplish what only a soaking cleanser, like soda ash, can accomplish inexpensively and effectively.

Oil in a refrigerating system has a most deleterious effect upon it, reducing its output most seriously. The removal of oil is a most neglected operating routine. It gets in slowly and comes out slowly. I venture to say without hesitancy that all of you here have enough oil in your evaporators to operate your plants for two years. I usually find that this oil in the system can be measured in barrels in most plants and this goes for many otherwise excellent plants. This oil properly filtered, in an inexpensive filter, is equal if not superior to fresh oil. An inexpensive filter of 30 gallons capacity merely consists of a Fullers Earth round pillow set on a screen in a 30 gallon drum.

While on this matter of oil, let me state that the plants are few where a good quality of oil will not suffice for all lubricating requirements, pumps, motors, and what have you. Only in an air compressor cylinder is a different quality of oil required most times.

Difficulties due to algae growth, fouling of condensers, and tube errosion can be eliminated today most entirely through the moderate usage of chlorine and phospheric acid compounds, slowly fed into your cooling systems, and even city water systems. These compounds judiciously used do not influence ice quality or hazard life. Chlorine is a destroyer of bacteria, particularly necessary in the dip tank, which is a major source of bacteria in ice.

The use of dichromate in brine, I have used it since 1922, insures ice cans from deterioration due to corrosion. Cans 20 years old are not unusual—brines kept clear for over 20 years is another result from this treatment.

Ammonia Charge

A very common source of power wastage is due to inadequate ammonia content in a plant. The liquid seal in an ammonia receiver should never be less than 6 in. An inadequate seal means that compressed vapor blows through the liquid line with the consequence that the power required to compress it is all a loss aside from being a near weird trouble maker. In some plants it may be difficult at times to retain a seal,—perhaps labor is not alert. The effective cure for this is a trap in the liquid line—a modified steam trap and inexpensive. When the seal is broken and gas blows through, the trap will stop all flow of gas and the condition of inadequate ammonia evidences itself by a frosting or very cold liquid line, Fig. 1.

Management in all industries, not yours alone, are very labor expense conscious, and much is being done about it. Capital expenditures up to $12,000 are felt justifiable if the saving in labor of one man annually results. The usual

Fig. 1—A high side float or trap used to stop flow of refrigerant gas if the liquid seal ahead of the expansion valve is broken.

Presented at the 1949 Convention of the Eastern States Ice Association.

inclination is to damn labor and urge more effort. This path leads to nowhere. Labor will no longer be pushed today or speeded up, and there is nothing in the offing, even a depression, to change this condition. There is nothing wrong about raising the production output per employed man—provided it is not secured by driving or more sweating. To secure more output from labor, means must be provided and conditions brought about to effect it.

So much unnecessary labor exists in our plants because of poor planning. Much time is lost each day in walking time—getting about the plant to attend to details. Engine rooms are often too remote from the rest of the operation. A whole operation should be compact. This does not mean crowding up of equipment, for that is bad. The tank and engine room should be a one level operation. The detailed work of valve regulation and control should be all automatic,—temperature, pressure, thermostatic, float or time controlled. Chemical treatment of all water for whatever purpose reduces labor and maintenance expense. The avoidance of these chemical treatments brings about a condition calling for labor effort to do the correcting.

All plant operations should be continuously observed where labor is expended to discover how to reduce it. Low pressure ice plants with drop tubes can be effectively improved by merely attaching the tubes to a lateral so that they center perfectly at all times and hang directly from below the lateral, not from the side.

The use of centrifugal water jet air compressors in lieu of piston compressors in a high pressure plant avoids much necessary attention to air compressors and their maintenance. Furthermore the centrifugal jet compressor can be reliably operated at all periods with no manual attention required, Fig. 2.

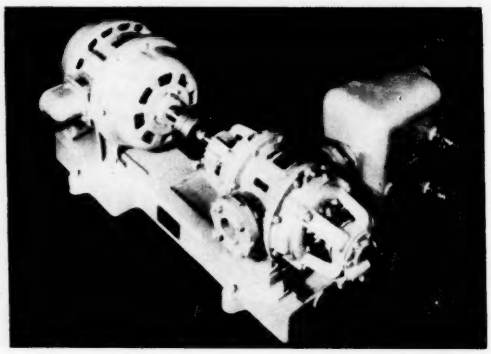


Fig. 2—Centrifugal water jet air compressor, suitable for furnishing agitating air to ice freezing cans. It is simple in construction and furnishes cleaned and cooled air in one operation. Photo from Nash Engineering Co.

Reduce Handling Labor

In the matter of can lid removal, it is usual to uncover and then cover each row as it is worked upon. This is a habit of long standing and custom. Is there any reason why only the first row of covers should not be lifted and then covered by pulling over this row the covers of the successive row to be next lifted? Only at the end of the day is the first row of covers pulled down the tank to cover the last row. Such a procedure as this does save time and makes ice pulling that much easier.

The use of cable drag conveyors to pass dumped ice one block at a time into the storage has the merit of being inexpensive. Ice dumped into a storage directly wastes valuable storage room space and carries water into the storage which freezes and must be scraped loose and disposed of. You pay for this labor and take a man away from another job—in other words, create more work.

Ice enters a storage room butt end first. To feed it to a scoring machine a man must turn this ice completely around to feed it into the scoring machine. If the ice conveyor is timed to run as fast as the scoring machine, or a little slower, a simple turn table can be built to automatically turn it and with other mechanical means feed it in proper time to the scoring machine. In other words, after the ice is dumped only a man on the discharge end of the scoring machine is needed to move the ice away and avoid its breakage by following blocks banging into it.

For upending, an excellent proven portable machine is now available to do this job. Its use in loading trucks and railroad cars is most valuable, particularly when automatically operated,—a simple matter. Every labor task relieved from the usual storage room labor results in making time available for the costly operations of sizing and bagging ice.

Cubing machines are demonstratably best located in a warm room where the waste ice drops into a pit and is melted by sprays. If there is much of this waste to be melted the ice water produced can effectively be used to cool liquid ammonia and thus bring about a substantial recovery of the refrigeration represented in the waste ice. Cubing machines in the ice storage entail a labor problem to dispose of the waste.

We are all more or less familiar with one shift per day plant operation. To effect a change to such operation is an inexpensive one, calling for a few thermostats, solenoid valves, electric relays and wiring. One shift per day operation will reduce a plant's 3 shift operation output close to 20 per cent per day. This drop in output can be recovered in part with some added investment cost in additional tank and compressor capacity. The power costs per ton will rise some in these plants. Its great drawback is that it conflicts with many municipal and state safety regulations which compel the employment of a competent operator when large high pressure compressors are in operation. Unquestionably there is some hazard, however well protected, when operating a large ammonia refrigerating system unattended in the proximity of residences and businesses.

That one shift per day operation will be provoked or compelled by ever increasing labor costs and policies is not at all unlikely within the next 10 years. It is something to keep in mind and to think about before it arrives. Such operation will involve the employment of more ice can tankage, more high side equipment and higher power costs. The requirement for more tankage may be offset by the developments now well advanced with water treating systems that hopefully indicate ice making possible with 6F brines. Compressors themselves will soon be operating at speeds 25 per cent higher than today's speeds. 9 x 9 compressors at 400 rpm. are getting quite common. 10 x 10 compressors for some years have been running at 360, and I have one 10 x 11½ operating for some years at 375 rpm.

Unit Costs

It is important that the members of this industry discuss freely their labor costs—but not in dollars. I would like to see the use of figures based on tons of production per man hour adopted. This labor must include all labor in the plant, including that in the ice storage. This would be a standard of measurement and comparison for all plants and reveal them as to their true character. Such figures studied by the management for their own plants would enlighten them at all times as to how their production costs are

varying through the seasons. In this figure of tons of ice per man hour I would like to repeat that the labor used for the engine room, tank room, storage room and for scoring be included in this figure. The extra labor for cubing, sizing and bagging should be something apart and similarly expressed. Without some figures of this character to discuss and compare we are never going to learn anything about how good or bad our operations really are, and where improvements lie.

Recently I had occasion to make such comparisons. The results were surprising. In these figures the labor involved in the engine room, tank room and storage was included.

For a 135 ton plant with no season storage the output was 3.5 tons per man-hour in the summer. Winter operations were costly and a trial was made to operate with the three engineers only employed for the entire operation of plant and storage. The plant operated one shift per day and then closed down. Two of the engineers worked 6 days of 8 hrs. a week, and one 5 days of 8 hours a week. Forty-five tons of ice was pulled daily excepting on Sunday, when one man operated only and pulled 22½ tons of ice. All ice was scored. This operation is successful and results in producing 2.15 tons of ice per man hour, which will be found a low cost winter operation. Four days of the week 3 men worked together in the plant doing the winter overhaul work, as well as operating the plant.

Five other plants were similarly checked:

Two were of 63 tons daily capacity, 22 years old, and of the loose two can type with 2000 ton season storages. The record for the year was 0.873 tons of ice per man hour for 11 months. They had a 100 per cent load factor on them for 11 months.

One multiple lift 71 ton plant with an 1800 ton season storage and a 100 per cent load factor for 11½ months produced 1.48 tons per man hour.

One multiple lift 63 ton plant, with a 2200 ton season storage and a 100 per cent load factor for 11½ months produced 1.31 tons per man hour.

One 50 ton multiple lift plant with 1500 ton season storage produced 1.04 tons per man hour.

All of these plants were handicapped with a season storage since they required a storage man 3 shifts a day.

An 80 ton plant with no season storage produced 2.25 tons per man hour under summer operation, while another 110 ton plant produced 4.75 tons of ice per man hour under summer conditions. That this latter plant can maintain this operation is dubious, I may say, because the best reasonable operation for plants of this size is usually 3.80 tons per man hour.

The implications of these figures are that a wide variance in production per man hour exists. In all of these plants which I am familiar with the men are not slaving but are decently busy and working under pleasant conditions. This wide variance along with your own figures for your own operations is something to think over and work upon—principally management of them. The off peak seasons appear to be the readiest ones susceptible to improvement.

Maintenance Costs

The last phase of costs are those involved with maintenance. Well maintained plants last forever and practically never wear out. Such maintenance is essential to insure reliability and continued efficiency. Profits too often are secured by deferring maintenance—it is a costly one I can testify from experience—a day of reckoning always comes. Maintenance, however, can be excessive, more so today than ever, and is a matter calling for more attention than ever before.

To keep these costs reasonable calls for some changed ideas on our part. It does appear for instance that pulling down compressors annually is no longer necessary and it is only necessary to do this every 10,000 hours of operation with only a valve inspection and oil change every winter.

Ball bearing motors and equipment suffer most from over lubrication, and this can only be stopped by the plugging up of all grease fittings and annual relubrication only, if no difficulties are observed.

Cleaning and washing grease from all motors after every 6000-8000 hours of operation is still good practice but revarnishing is not necessary except upon test indicating it necessary. Numerous motors are destroyed by poor and excessive varnishing, which builds up and aggravates an over-heating condition.

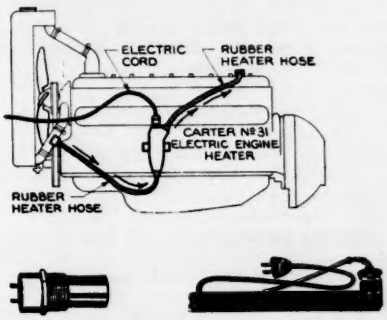


Fig. 3—Three types of electric automotive engine heaters. Above, tube connected; left, insert type; right, clamp on type. Illustrations from James B. Carter, Ltd.

The use of modern wood preservatives, consisting of Pentachlorophenal bases, are near infallible preservatives of wood. Merely painted on the surface these water consistancy applications penetrate definitely and clear through lumber, protecting it from fungus attack, as well as being a water repellent. These, like some treatments to brick work, concrete and concrete block, likewise make them water and moisture repellent.

Trucks stored in open sheds during the winter, and in unheated garages, result in a heavy attrition to the motors, batteries and starters of these trucks. In Canada this common practice is relieved by using electric heaters plugged into them at the end of each day. Practically all passenger cars are likewise so fitted. There are various forms of them,

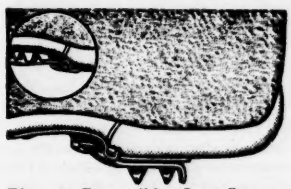


Fig. 4—Reversible Ice Creeper which can be turned up under the instep of shoe or overshoe when not in use. Photo from O. A. Norlund Co.

easily applied, to any car or truck of standard manufacture. Their cost is moderate. Some are entered directly into the cylinder block through a frost plug. Some are introduced into the water hose connection. The commonest form for trucks, however, is merely clamped to the cylinder block. This is an old device in Canada—a new one to this country. They are made in Canada—by U. S. motor truck manufacturers and others, Fig. 3.

Another small item I find used in Canada on mens' and womens' rubbers, is an ice creeper right under the instep next to the heel. By merely flipping it over as desired one has a hardened steel creeper, effective for walking on ice. When entering a building with finished floors they are tripped out of the way. As an accident preventative they should be of interest to you. They cost less than 50 cents, are not bulky and can be attached to rubbers in a few minutes by a cobbler. The device is shown in Fig. 4. This product, foreign to us, is manufactured in Pennsylvania.

It does appear that we should be more observant of what others accomplish and how they do it. We are inclined to be obsessed with the idea that all improvements stem from the U. S. The common storage battery in Europe is of a life long type, and entirely unknown here.

None of these small items I mention are in themselves of particular consequence, but in the aggregate they will result in sizeable economies over time.

Processed Ice

Lastly are the problems associated with the ever increasing usage and sales of sized ice and cubes. What I have to say on these matters are personal observations supported by some varied experiences.

1. Ice cubing machines should be in a warm room, with means for ready disposal of waste ice.

2. Ice sizing units should be of large capacity ratings—i.e., tons per hour. A 10 ton per day sized ice business calls for a 20 ton/hr. unit. Such a unit serves a 100 ton a day ice business equally well. It is economical for the small 10 ton business because it gets the job done with and over quickly and frees labor for other work. Large bins for storage are not necessary. Sized ice should be stored in the shipping container. This goes for cubes as well. There is only one container, and that is the paper bag. Boxes, baskets, canvas bags, and what have you, are proven insanitary containers. The Boards of Health will handle that for you in very short order. Ice sizers should be provided with means for feeding whole blocks of ice into them and broken into pieces as they feed in. This makes for speed and for less fines.

One sized ice machine manufacturer, whom you know well, has done yoeman service in developing a machine to accomplish an automatic packaging unit. A small fortune has been spent upon it, developing it and struggling with ever new arising problems. From it all there will evolve a unit as near suitable for your needs as it can be built. It will be short of our dreams and expectancies, but it will be a long advance to that end. It is a unit being born in much travail. Other companies too are flirting around with packaging devices. When one and all are offered they should be purchased by you. This industry will never get its desires if it fails to support the manufacturer in his progress towards a perfect machine, which will only come about in a slow step by step motion towards that end. The number of machines that will be purchased does not warrant any manufacturer developing alone and unaided the unit ultimately desired.

3. As to the importance of weighing ice accurately into packages. I believe the importance and demands made on this score are near absurd. The most inexpensive items of your business are the direct and indirect costs of producing ice. These costs are about 1¼ mils per lb. An average of 2 to 3 lbs. excessive weight in a package means nothing. To secure accuracy with labor costing 2 cents per minute is one exposure of this waste and cost fixation. Other industries have been all through this and have wisely forgotten it.

Food products costing ½ to 1 cents per ounce ask for no such accuracy as demanded by the ice industry. They too have severe weight standard regulations to abide by. In a canning plant I recently had occasion to observe, women at the can filling stations gaged weight by eye and as cans were occasionally checked for weight they merely varied the technique of hand pressing more or less into each can. They did a remarkable job, these casual seasonal employees. I have observed ice weighed into packages and ice just gaged by eye. The gaging method was near as accurate as weighing and resulted in all of 25 to 30 per cent faster filling. Be reasonable in your demands and seek only the end result.

4. Handling packaged ice so far has been most successful, that is, least costly and fastest with light large two wheeled pneumatic trucks. Roller conveyors and powered belting has not done so well. For high piling and conveying it is my prediction that inexpensive cable conveyors will eventually evolve themselves. Who is ready to build and try one out?

I hope these remarks of mine, covering a wide and disarranged territory, will provide some food for thought and profit to you. Most of all I hope I have provoked some discussion between people in the industry.

Europe Offers Market for Products Marketed by Cooperatives

EUROPEAN consumer cooperatives are potential buyers of a substantial volume of agricultural products marketed by cooperatives in the United States, John H. Heckman, marketing specialist, has reported following a study in Europe of the possibilities and limitations of expanding that type of international trade. Mr. Heckman was assigned by the Farm Credit Administration to the Office of Foreign Agricultural Relations to conduct the study under the Research and Marketing Act program, U. S. Department of Agriculture.

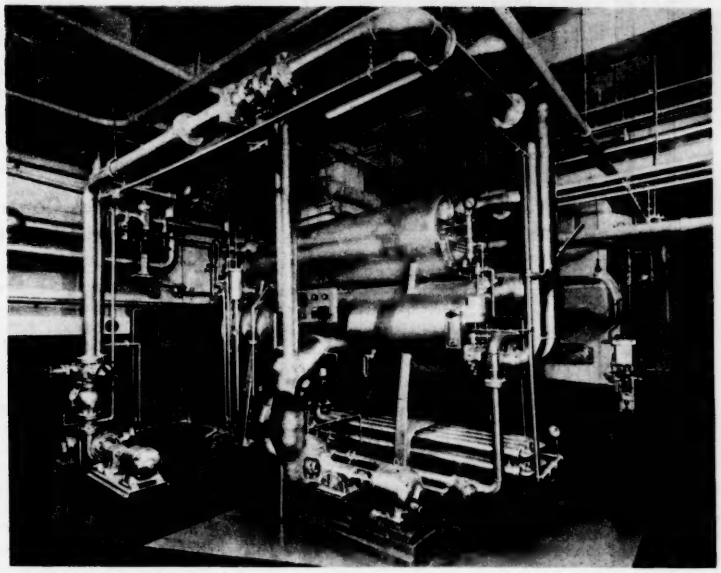
United States agricultural cooperatives are an important factor in the marketing of commodities which historically have sought, and currently are seeking, export markets. The European survey was an effort to determine to what extent United States foreign agricultural trade might be increased by utilizing the facilities provided by cooperative marketing associations abroad. Particular attention was given to the possible marketing of United States products handled by cooperatives in this country.

Mr. Heckman's study was conducted in England, Scotland, Norway, Sweden, Denmark, The Netherlands, Belgium, France, Switzerland and Italy. Both agricultural and consumer cooperatives in these countries use products from the United States. However, the consumer cooperatives have been the biggest buyers. The marketing specialist reports that consumer cooperatives are planning to deal more directly with foreign suppliers. Leaders of European cooperatives have expressed a preference for cooperatives as a source of supply. They made it clear, however, that their preference did not take into consideration price differences, but was based upon a "good will" preference under the same trading conditions.

Many products handled by United States cooperatives were cited as needed by the European marketing groups. The list included frozen eggs, evaporated milk, inedible fats for soap manufacture, grain sorghums, and protein meal and cake.

Mr. Heckman states that in translating the need described into terms of actual purchase it should be remembered that trading in most of the countries he studied is still limited by quotas, embargos, and currency regulations, and that inter-cooperative trading must be within the framework of these restrictions.

New Absorption System Used in Air Conditioning Work



The new type absorption machine of 150 ton daily capacity provides refrigeration for the air conditioning of the Oklahoma Natural Gas Building, Oklahoma City. It operates on 12 psig. steam.

THE development of a new refrigerating machine that employs steam for air conditioning purposes—and thereby provides a balance in steam loads for summer cooling and winter heating has been announced by Carrier Corporation. Representing more than eight years of research and development, the new unit is an absorption machine which uses plain water as a refrigerant and a simple salt as an absorbent, Carrier officials reported.

Cloud Wampler, president of the corporation, announced the development at the offices of the Consolidated Edison Company of New York, Inc., which has been operating an absorption machine since 1946, using steam supplied by New York Steam Corporation. A number of such machines have been installed in various parts of the country with entire satisfaction, he said. First public announcement of the development was purposely withheld until it had been thoroughly tested over an extended period in both commercial and industrial applications.

"This absorption machine," Mr. Wampler said, "represents a significant advance in modern air conditioning, particularly in areas where steam can be produced at relatively moderate costs, where there are district steam plants, where natural gas is available, or where a factory or department store or office building has a steam plant that is lying relatively idle in summer.

"The unit will operate on either high or low pressure steam, or even low pressure waste steam. Aside from a small solution pump it has no moving parts, and therefore is practically noiseless and vibrationless. It is lighter in weight and more compact than other heavy duty refrigerating equipment, and is entirely suitable for installation on rooftops or intermediate floors as well as in basements. And with a low-cost source of energy and the use of water and a salt as a refrigerant-absorbent combination, operating costs are extremely attractive."

The new machines are produced in 115, 150 and 200 ton capacities, meaning that they are capable of creating a cooling effect equivalent to the melting of like amounts of ice each 24 hours. Single units will air condition areas of from 34,500 to 60,000 square feet.

Tests Show Efficiency

Donald French, vice president in charge of Carrier's Engineering Division, reported that tests showed the present absorption machine operated at higher efficiency than earlier types of absorption machines and also represented a lower initial cost because there was no need for rectifiers to purify the refrigerant.

"We do not yet know the ultimate limits and capacities of this machine," Mr. French said. "For air conditioning purposes, water chilled to 45 degrees is generally satisfactory. And where lower temperatures are required for industrial processes, these units will bring water down to 36 degrees.

"However, the present machine uses less than 20 pounds of steam per hour per ton of refrigeration—no matter what the steam pressure. It will automatically adjust itself to partial loads down to 15 per cent of total capacity without loss of efficiency, and when higher tonnages are required it is readily adaptable to multi-unit installations."

The first multi-unit installation was made in the First National Bank Building in Oklahoma City and was placed in operation during the summer of 1948. The new absorption system machines have also been installed in twelve other locations throughout the country during the past three years.

(See next page for flow diagram illustrating various parts of the system and description of the refrigerating cycle).

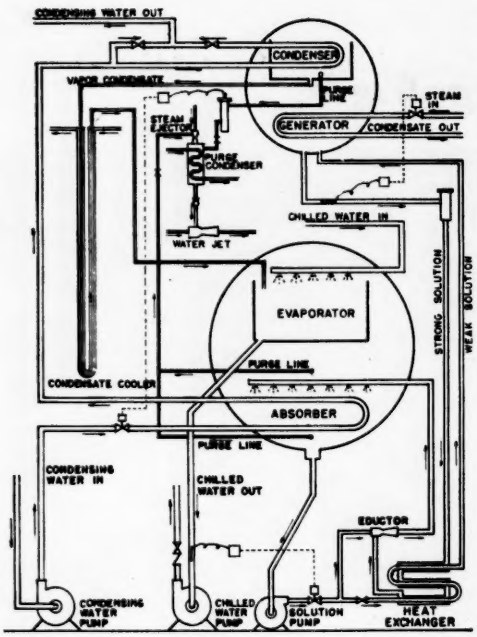


Fig. 1—Flow diagram of the high temperature absorption refrigerating machine illustrates the various parts of the system and their functions. They operate as follows:

COOLER Chilled water returning from the air conditioning coil or other imposed load on the machine is sprayed into the cooler. Since this shell is maintained at a low absolute pressure, some of the chilled water flashes and cools the remaining water to a temperature which very nearly corresponds to this pressure. Upon being cooled the chilled water drains from the cooler tank and is pumped to the load.

ABSORBER The lower portion of the absorber shell is occupied by the absorber tubes. Concentrated solution (strong in salt) which has the power to absorb the water vapor, is sprayed over the tubes, and absorbs the water vapor flashed in the cooler. The absorption and condensation of water vapor in the solution reduces its salt concentration, thus reducing its absorbing power. Weakened solution is continuously drained from the absorber and is pumped to the generator to be concentrated.

HEAT EXCHANGER Since the weak solution going to the generator is relatively cold and should be preheated, and the strong solution leaving the generator is hot and should be cooled down (to increase its absorbing power) a heat exchanger is provided, thus saving steam and condensing water.

GENERATOR The generator tubes are located in the lower portion of the generator. Steam admitted into the tubes heats the solution around the tubes and boils off the water vapor which was absorbed in the absorber; thus the solution concentration is restored.

CONDENSER The water vapor boiling from the solution is condensed by condensing water in the tubes in the condenser. The condensed water vapor is returned through a condensate loop to the cooler tank. A column of water is formed in the loop which seals against the pressure difference existing between the two shells.

EDUCTOR Solution pump from the absorber is divided into two flows (1) solution to the generator and (2) solution to the eductor. That part which is pumped to the generator passes through the heat exchanger and cools the hot solution coming from the generator. The remaining part is used as an impelling fluid in the eductor, which helps to remove the solution from the generator and return it to the absorber. Weak solution from the absorber and strong solution from the generator mix in the eductor and both are returned to the absorber.

Heat is liberated by the vapor being condensed in the absorber and in the condenser. This heat is removed by condensing water which passes through the absorber and condenser tubes in series.

Texas Gas Concern Installs New Steam Air Conditioning Machine

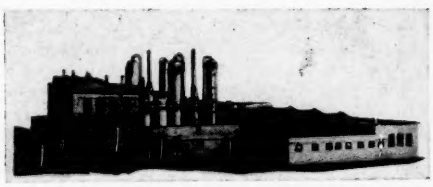
A $500,000 air-conditioning system that uses gas-generated steam for both heating and cooling is being installed by the Lone Star Gas Co. in its two office buildings in Dallas, Texas, according to announcement by Wesley F. Wright, general manager of the company's Dallas division of distribution. The system which is expected to be in service this summer is described and illustrated in the article starting on the previous page.

Refrigeration for the two buildings will be supplied from a central plant on the thirteenth floor of the Harwood St. building. A battery of four new-type absorption units, each rated at 135 tons capacity, will provide cool air in summer. These units will take steam from existing boiler plants in the basements of the buildings. A steam-to-water exchanger is being installed for winter use. Temperatures in each office will be fixed by individual unit control.

The C. Wallace Plumbing Co., of Dallas, is contractor for the project. The installation was designed by Zumwalt & Vinther, Dallas consulting engineers.

New Dry Ice Plant Opened in Chicago

THE OPENING of a new carbon dioxide and Dry-Ice manufacturing plant at 1856 South Lumber St., Chicago, Ill., is announced by Pure Carbonic, Inc., an Air Reduction subsidiary and one of the largest suppliers of carbon dioxide in the country.



New carbon dioxide plant opened in Chicago.

The new plant has a daily capacity of more than 140 tons, making it one of the largest units of its type in the United States. The two-story brick and steel building, located adjacent to the main line of the Pennsylvania Railroad, occupies 38,500 sq. feet of floor space and was built at a cost of approximately $3,000,000.

The uses for carbon dioxide range from carbonated beverages to fire extinguishers. Other important applications are its use as a refrigerant in the shipments of perishable foods and as a refrigerant or inert gas in the processing of plastics, paints, etc.

Refrigerated Warehousing Industry

NEWS • ARTICLES • ANNOUNCEMENTS

NATIONAL ASSOCIATION of REFRIGERATED WAREHOUSES

Division of American Warehousemen's Association

Executive Offices:
Tower Building, Washington 5, D. C.

Secretary, W. M. O'Keefe
Executive Vice-pres., Wm. Dalton

President, Arthur N. Otis
New York, N. Y

Vice-president, Fred F. Alford
Dallas, Tex

Treasurer, J. L. Gagini
Omaha, Nebr.

NARW Executive Committee Meets—Approves Reports of Special Committees—Chapter Meetings

THE second quarterly meeting of the executive committee of the National Association of Refrigerated Warehouses was held at the Congress Hotel in Chicago Monday and Tuesday, May 9 and 10. This meeting followed by one day the meetings of three special NARW Committees whose recommendations were to be passed on by the Executive Committee.

The first of these Committees offered recommendations regarding the revision and modernization of the trade practice rules for the commercial cold storage industry which were approved by the Federal Trade Commission in November 1931. Another special committee recommended procedure to effect a more accurate reporting by individual firms of cold storage space occupancy and holdings to the Department of Agriculture. The third special committee recommended tentative plans to assure adequate cold storage space and services to the armed services in the event of an emergency.

The Executive Committee approved or concurred in the actions and recommendations of all three of these special committees. Consideration is now being given to the most effective means of carrying out these recommendations, and details of these programs will be made known when final plans are completed.

The Executive Committee also discussed pending federal legislation and the activities of NARW's Legislative Committee. A resolution was adopted praising the Legislative Committee for its splendid work in the past and recommendation was made that it proceed in the same manner on any future legislation it thinks may affect the industry.

Other NARW standing committees and their personnel were set up for the coming year. These include Safety, Banking, Traffic, Insurance and PACER Committees.

The Committee also approved a campaign to expand the membership of the association and this will get under way immediately.

Plans for the 1950 convention scheduled for January 30-February 2, at the Edgewater Beach Hotel in Chicago were also discussed. The possibility of an association sponsored health and accident group insurance program for those NARW members not having such plans of their own was discussed, too, but final action was postponed pending further study and investigation.

Chapter Meetings

The North Atlantic Chapter met in York, Pa. on Friday, April 29. Talks were given by J. P. Johnson of Washington, chairman of the Legislative Committee; Marshall G. Munce, vice-president of the York Corp., one of NARW's associate members and W. M. O'Keefe, secretary of the National Association of Refrigerated Warehouses.

New officers of the Great Lakes Chapter elected at a recent Chicago meeting, to serve during the coming year are:

Chairman, R. M. Conners, U. S. Cold Storage Corp., Chicago, Ill.

Vice-chairman, Harry Foster, Cincinnati Terminal Warehouses, Cincinnati, Ohio.

Secretary, Wm. C. Baker, Produce Terminal Cold Storage Co., Chicago, Ill.

The New Jersey State Association of Refrigerated Warehouses held a meeting in York, Pa., Thursday, April 28. Among other business transacted, the following officers were elected to serve during the coming year:

President, J. K. Storer, Union Terminal Cold Storage Co., Jersey City, N. J.

Vice-president, Conrad Proebstle, Atlantic City Ice & Cold Storage Co., Atlantic City, N. J.

Secretary-treasurer, Robert E. Baker, Camden Refrigerating & Terminals Co., Camden, N. J.

Directors: Leo Fisher, Harborside Warehouse Co., Jersey City, N. J.; H. J. Leyendecker, Haddon Ice & Coal Co., Haddonfield, N. J.

Improved Egg Cases

The Shell Egg Packing Committee, according to "Cold Facts" issued by the National Association of Refrigerated Warehouses, met in New York recently to consider methods of improving egg cases. Considerable controversy centered around their sizes. The interests of the warehousing industry in a uniform size; convenient for carloading, palletizing, etc. are being represented by D. O. Haynes, vice-president, Merchants Refrigerating Co., New York, who represents NARW on the committee.

New York Ranks First in Refrigerated Warehousing Capacity

CLAIMING 13 per cent of the national total, New York State last year ranked first in the United States in refrigerated storage capacity, both public and private, according to a study of the warehousing industry made public April 21 by the New York State Department of Commerce. This rank was determined without including refrigerated apple storage houses, an important factor in the state's fruit growing areas.

According to a recent estimate, the department said, New York has 18 per cent of the public cooler space in the country and 14 per cent of the public freezer space. "Feeding New York State's population and preserving the products of its farms and processors requires a tremendous amount of refrigerated warehousing space," the study pointed out. From September 1947 to September 1948, the New York State Department of Agriculture licensed a total of 609 cold storage warehouses and locker plants, both public and private.

New York State's refrigerated warehouses, it was revealed, contain approximately 80,000,000 cu. ft. of storage space, of which about 95 per cent is devoted to regular cold storage and the other five per cent to lockers. The principal plants of refrigerated warehouse licenses are distributed as follows: 85 in the New York metropolitan area, 118 in eastern New York, 79 in central New York and 129 in western New York.

Disclosing a sharp expansion in the frozen food locker business during and since the war, the study found that the number of plants containing locker space in New York State increased from 21 in 1940-41 to 210 in 1947-48. There are now 106,507 lockers in the state, mostly located in small towns, the study showed.

"New York State's high concentration of population and leadership in manufacturing and trade combine to make the state a natural center for public warehousing," the report declared. The study found that New York City, which does 8 per cent of the retail trade and 23 per cent of the wholesale trade of the United States, is the center of warehousing in New York State and the nation. The $30,500,000 worth of import-export trade which passes daily through the Port of New York creates a further demand for public warehousing.

Gross Elected President Northern Cold Storage & Warehouse Co.

THE Northern Cold Storage & Warehouse Co., Duluth, Minn., announces the election of George L. Gross as president following the death of Frank E. Fregeau who had headed the organization since its inception in 1906.

George L. Gross

Mr. Gross has been an official of the company for 32 years and is thoroughly familiar with all its operations. He is an engineering graduate of the University of Wisconsin and is well acquainted with the fruit and vegetable industry as well as the butter, egg and poultry trade. He is a member of the Chicago Mercantile Exchange. He is immediate past-president of the Duluth Rotary Club.

Survey Shows Increasing Interest in Materials Handling Equipment

A LARGE majority of business and industrial executives are unacquainted with current developments in materials handling equipment despite the fact that materials handling is one of the few fields in which cost reduction can be accomplished, it appeared from a study of the third Materials Handling Exposition held in Philadelphia last January. A survey of visitors revealed 86.6 per cent found equipment displayed which was valuable to their company btu which they had not known about before.

This unprecedented study, the most comprehensive and penetrating inquiry ever made in the field of industrial expositions, was made by the research firm of Elmo Roper, for Clapp & Poliak, Inc., exposition management firm, and the American Society of Mechanical Engineers.

"Ninety-five per cent of the visitors said they found equipment at the show of value to their companies," a preface to the report states. "Eighty-six per cent of all the visitors to the show say they not only saw equipment of value to their companies, but saw equipment they had not known about before. Seventy-four per cent say they plan to buy equipment as a direct result of the show. Yet only 54 per cent said they went to the show with the idea of looking at specific equipment."

Visitors were asked if they had seen equipment of value to their companies. By industries, the answers of those representing transportation and warehousing was 94.3%.

The survey revealed that two-thirds of those who attended the Philadelphia show were a "new" audience in that they had not attended the 1948 exposition in Cleveland. Of the total audience, 95 per cent stated they had come to see "new developments" in materials handling, while 28.5 per cent came to get an answer to a specific question, and 18.1 per cent to attend one or more of the technical sessions. Almost three-fourths (74.3 per cent) stated that the visit to the show has led or will lead to the purchase of materials handling equipment.

The exposition, which grew in three years to one of the three largest annual industrial shows in the country, drew its attendance from a wide cross-section of American industry and indicated that business executives in all fields are giving added attention to handling problems.

Cold Storage Not Liable for Damage From Escaping Ammonia

THE Supreme Court of Errors at New Haven, Conn., has ruled that the operator of a cold storage plant is not liable for goods damaged by escaping ammonia. The ruling was made in the case of Marshall Watrous of Wallingford who claimed that 2,200 boxes of apples had suffered damage from escaping ammonia. In its opinion, the court held that "the escape of free ammonia was an event which, under the facts of the case, must be classified as an accident."

Appel Leaves for Arabia

ADDING to his trans-Atlantic voyages, Vallee O. Appel, president, Fulton Market Storage Co., Chicago, and president of the Refrigeration Research Foundation, left by plane June 2 for Sudan, Arabia. The purpose of Mr. Appels' visit is to inspect and survey food facilities for the Arabian-American Oil Co. Sudan is the site of tremendous oil developments. He is expected to return by air June 21.

Refrigerated Warehousing Industry

Another $50,000,000 to Destroy Food

IN the fall of 1947 consumers were filling the air with anguished cries about the price of eggs. At that time housewives were getting little change from a dollar when they bought a dozen eggs. It all resulted from the egg inflation program engaged in during the spring by the government buyers. The law directing their operations is usually called the "support program." Under it they bought eggs which normally would have moved into storage.

By fall this program had resulted in price inflation which clipped the egg consumers and brought a considerable outcry but they did nothing about it. Probably they knew nothing about the basic causes.

Repeat Performance

This spring the government inflation program is being pursued in the same manner, only with greater intensity. In 1947 only a portion of the eggs purchased to inflate prices were destroyed for domestic use. From 4,447,000 cases of eggs purchased by the government, 63 per cent were dried and 37 per cent frozen. The term destroyed is used advisedly because there is little market for dried eggs in this country and the people who pay for their purchase and processing cannot use them.

This year the egg program has taken over 5,000,000 cases of eggs off the market and dried them. The amount destroyed for consumer use therefore is 80 per cent increased over 1947. The direct cost is placed at more than $50,000,000, which comes from federal tax funds. This is only the beginning of the ultimate costs to the consumer as past experience has shown.

Before government inflation practices took over it was customary for private buyers to purchase the surplus eggs for storage until the following fall and winter. During these shortage periods the stored eggs moved to market. Most of them were consumed in commercial establishments but an important portion also went to domestic consumers. The results were beneficial to both producers and consumers because the market was stabilized in both directions.

In the spring the purchases by egg storers removed the surplus overhanging the market and prevented it from driving prices down to ruinous levels where producers would not receive a fair return for their product. Then in the fall these eggs came out of storage to make up the difference betwen lowerd production and a rather steady rate of consumption.' Because of this balancing effect, the price of eggs was not inflated in the fall. Everyone benefitted by stable prices through the year and steady consumption of eggs. The latter, is very important too if all the egg producers wish to continue in business. There is an analogy in the meat industry.

Lost Markets

In the post rationing frenzy it appeared that people would pay any price for meat. There seemed to be no limit as meat soared to price levels far above most other foods. Packers competed with each other to obtain volume and the live stock market gave no evidence of having a top. The consumers, almost unnoticed in the rush however, began to cut down on meat purchases. Despite this fact they were told in the fall of 1948 that less meat would be available the following spring and it appeared that prices would rise.

Now we are in that period but the predictions are not being fulfilled. Prices are continuing a downward trend because consumers more and more are continuing their reduction in meat eating. For instance some packers reported that they cleaned out their stocks of Easter hams at a loss because the people just would not pay the prices at which they had been expected to buy.

The same situation can devlop in the egg market and the results will not be generally evident until it is too late for remedial measures. Perhaps the egg producers cannot now see anything to worry about as long as the government will buy whatever they produce at high prices and then destroy the eggs. This year authoritative data indicates that the government purchases have inflated producers' profits to some 60 per cent above what they made last year. When the fall comes around however it appears that the consumers will repeat their experience of 1947. Then the government inflated prices may not only bring reduction in egg consumption but a real push to change the system of price inflation by government action. It was established and is maintained by congressional act. It can be changed if consumers are sufficiently stirred to make a real protest.

Under present conditions the so-called support program works about like a dog chasing its tail, although the dog discovers his folly or gets tired more quickly. In the egg deal, government purchase and destruction of primary supplies disrupts normal storage procedure. This inflates egg prices and builds up consumer resistance. It could result in large egg surplus in which the government purchases would be greatly increased while the consumers continue to pay the bill in taxes and at the store. Meanwhile the storage space is available but the eggs are not in it.

Storage figures show a trend which looks worse than 1947 when the egg consumers faced painful ination in the fall market. The following data on eggs in storage is given in thousands of cases for current months, 1947, and the average for the five prewar years. Note that egg supplies accumulated in storage on May 1 this year are only 55 per cent of the 1947 figure and 28 per cent of prewar, five year average.

SHELL EGGS IN STORAGE, CASES, 000 OMITTED

	Feb.	Mar. 1	Apr. 1	May 1	June 1
1949	145	148	514	962	
1947	287	221	508	1,742	3,452
1937-41 Average	227	172	1,096	3,469	5,993

Canadian Cold Storage Holdings

THE Dominion Bureau of Statistics of Canada, Agricultural Branch, reports the following commodities held in cold storage on May 1, 1949, as compared with May 1, 1948 and April 1, 1949.

Apples in cold storage on May 1, 1949 amounted to 362,648 bu. as compared with 587,743 bu. May 1, 1948 and 740,359 bu. April 1, 1949.

Frozen fruit holdings in storages and factories May 1, 1949 amounted to 12,855,000 lbs. as compared with 8,441,000 lbs. May 1, 1948 and 13,958,000 lbs. April 1, 1948.

Stocks of frozen vegetables in storages and factories on March 1, 1949 amounted to 3,764,000 lbs. as compared with 3,622,000 lbs. May 1, 1948 and 4,969,000 April 1, 1949.

New Data on Storage Temperatures for Frozen Pork

A STUDY of deterioration in frozen pork has been made at the Kansas Agricultural Experiment Station in order that the effect of different storage temperatures on development of rancidity in the fat might be followed and also that other changes, especially those occurring in the muscles might be noted.

Frozen pork loin roasts double wrapped, first in moisture-vapor-proof cellophane, then in waxed freezer locker paper, were stored for periods up to 72 weeks at 10, 0 and minus 10 F. Other pork was stored at 0, minus 10 and minus 20 F. After 24 weeks of storage the superiority of minus 10 and minus 20 F. over the higher storage temperatures for frozen pork was indicated.

Serious freezer burn and excessive discoloration of the fat were not observed at any time during the study. Loss in weight due to freezing and storage was almost negligible. Six roasts lost less than 0.5 per cent in weight and eight roasts lost more than one per cent in weight. In no instance did the loss exceed 1.5 per cent. All eight roasts which lost more than one per cent in weight were in storage either 56 or 72 weeks.

The frozen meat tended to score lower in tenderness. Again this appeared to be a matter of freezing rather than of time or temperature of storage, at least as evaluated by the palatability committee. As measured by mechanical shear it was only after 56 and 72 weeks of storage that the force necessary to shear the frozen meat was greater than that required for the fresh meat.

Better preservation of quality in pork stored at these low temperatures was indicated by high palatability scores, by the absence of peroxides, and by low fat acid numbers.

Little or no effect was noted on shrinkage in storage or during cooking, on pH, on total or nonprotein nitrogen in either the tissue or in the press fluid, or on press fluid yield, which might be associated with either temperature or time of storage.

It appeared that the freezing process may result in increased press fluid yield.

There was some indication that longtime storage at any of the temperatures studied may result in an increase in resistance to mechanical shear.

Vitamin retention was high throughout the study, indicating the stability of these vitamins during low temperature storage.

The report of the investigation has been published by the Kansas Agricultural Experiment Station, Manhattan, Kansas, as contribution No. 376 of the Department of Chemistry. The investigation was supported by The Refrigeration Research Foundation.

Storage of Asparagus

A SUMMARY of information on the storage of asparagus is reported in a recent bulletin of the Refrigeration Research Foundation. In commercial production of asparagus, the report states, California leads, followed by New Jersey, Washington and Illinois, South Carolina and others. The two first named are the large producers of asparagus.

Fresh asparagus can be stored temporarily during an overstocked market. At 32 F. and with high humidity (85-90 per cent), growth of cut stalks and opening of heads are controlled. The original tenderness will also be preserved, and woody tissue does not develop, as at high temperature. Low-temperature, applied soon after cutting, protects the sugar content and flavor of fresh asparagus.

In storage, asparagus is commonly stood on wet moss or on other moistened material or held standing in trays containing water. Precooling—that is cooling immediately after harvest—is highly advisable and makes a better-storing product. Thus low temperature, high humidity, low air movement, and freedom from diseases are all critical.

Diseases that may affect the shoots are bacterial soft rot, fusarium (wilt) rot, and phytophthora, mold rot. They are readily identifiable. Bacterial soft rot is identified as mushy, soft, watersoaked areas on tips and cut ends. Fusarium rot appears as watersoaked areas turning through yellow to brown. Phytophthora rot consists of large watersoaked or browning lesions at side of cut stalks, which are later shriveled.

Control measures include precooling and shipping at 40 F. or lower, prompt handling, avoidance of bruising and keeping tips dry on market are best measures of controlling diseases.

Storage conditions are summarized as follows:

Temperature: 32 F.

Relative Humidity: 85 to 90 per cent. Low air movement is important.

Storage period: Three to four weeks—depending on such factors as age since harvest, and condition. In markets asparagus ordinarily should not be expected to keep more than three to six days.

Storage of Head Lettuce

A SUMMARY of information on the storage of head lettuce is given in a recent bulletin of the Refrigeration Research Foundation. California and Arizona produce most of the head lettuce consumed in the United States, the report states. California ranks first with 60 per cent of the total material production and Arizona second. Head lettuce is a year-round, comparatively stable-priced commodity in these states. New York, New Jersey, the Carolinas, Colorado, Washington, and a few other states also produce commercial head lettuce. In some sections, lettuce is placed in cold storage if the fall crop is threatened by cold weather. Surpluses on the market also may make cold storage advisable.

Lettuce offered for storage should be fresh and in good condition. It should be adequately iced in the crate or otherwise cooled so that it may not be damaged by field heat and heat of respiration. Even when held in cold storage (unless specially packed), ice tends to keep this produce fresher by preventing drying or wilting.

Tipburn is one of the most troublesome diseases of lettuce in transit and storage, particularly the type that results in slimness or bacterial rot in the heads. The disease is called tipburn because of small brown spots or areas that develop near the upper more tender exposed leaves. It appears in the field but in later stages it is frequently followed internally by a slimy bacterial decay which may result in serious damage. This disease is also called slime.

Frequent inspection is advisable during storage. Affected stock should be kept well cooled and should be marketed promptly to avoid the secondary rots.

Storage conditions are outlined as follows:

Temperature: 32 F.

Relative Humidity: 90 to 95 per cent. Low air movement is important in the preservation of general quality factors and vitamin content of all fresh vegetables.

Storage period: Two to three weeks—depending on such factors as age since harvest, cooling and handling.

Refrigerated Warehousing Industry

Specially Designed Elevators Are Required for Industrial Trucks

By Joseph Mastroberte
Design Engineer, Otis Elevator Co.

RECOGNITION by many refrigerated warehouses that materials handling by power trucks is vital to successful operation in these days of high labor costs marks an important advance in thinking. This method of moving storage commodities appreciably increases the tonnage handled per man-hour, consequently lowers costs.

At the same time, installation of an industrial truck system calls for a re-evaluation of the elevator equipment in the average mutli-story cold-storage warehouse. Most freight elevators installed before the war were not designed for power truck use and the added strains imposed by this materials handling equipment.

The conventional freight elevator is designed for gradual loading with the freight being fairly evenly distributed on the car platform. Power trucks, however, roll onto the elevator at high speeds, make sudden stops, deposit heavy loads unequally, and the added weight of the power truck itself (sometimes 8,000 pounds or more) puts additional strain on the elevator.

Unless the elevator is designed to resist the horizontal, rotational and other unusual forces imposed by heavy, fast-moving industrial trucks, the resulting punishment may damage the elevator and even the building.

Effects of Power Truck Loading

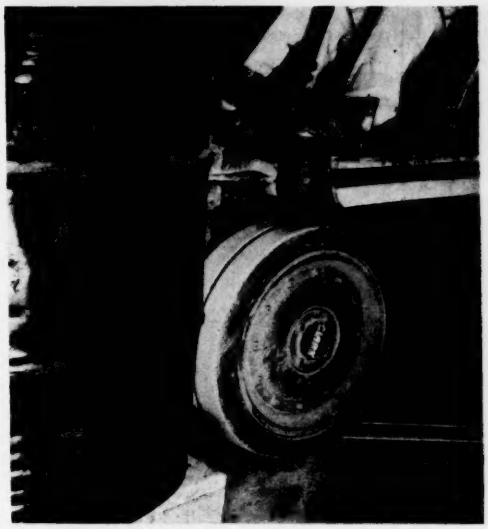
None of these factors enters the picture to a serious extent with the use of dollies or hand trucks, which weigh about 500 pounds. The relatively small pay-load of the hand truck is moved onto the elevator at slow speed.

Now let's consider what happens with a power truck. This machine may weigh as much as 4 tons or even more and its pay-load is proportionately heavier than that of the hand truck. This weight, moving at high speed followed by a sudden stop, delivers a severe impact on the elevator. As a power truck enters the elevator, it suddenly concentrates most of its own weight and all the pay-load at the front edge of the elevator car platform. This tends to tilt the platform forward. The power truck operator usually makes a quick stop, which puts an enormous lateral thrust on the elevator. The first heavy pay-load is usually deposited at a rear corner of the car, and, unless designed to counteract this force, the elevator may tilt to the rear.

After the truck deposits its load on the rear quarter of the elevator platform, the elevator must support this off-balance load until the platform is fully loaded and the load balances itself; or the elevator may be required to lift this unequally distributed load. Such off-balance loading puts unusual strains on all parts of the elevator structure and its punishing effect can be as much as two and one-half times greater than that caused by hand truck operation.

Elevators Designed for Power Trucks

As a power truck deposits the final pay-load to fill the elevator, as much as 80 per cent of the truck's own weight is added to the load the elevator must support, heavily increasing the static load. The forces set up by impact, off-balance and extra static loading are transferred to the elevator guide rails in the hoistway, then to the rail brackets, next to the rail backing and thence to the building itself.



Most of the weight of a power truck and its load is concentrated on the front wheels. An elevator platform must be flush with the floor landing to prevent damage to the elevator structure while being loaded by heavy industrial power trucks operating at high speeds. Automatic leveling devices on the new power truck elevators resist concentrated wheel loads such as shown here.

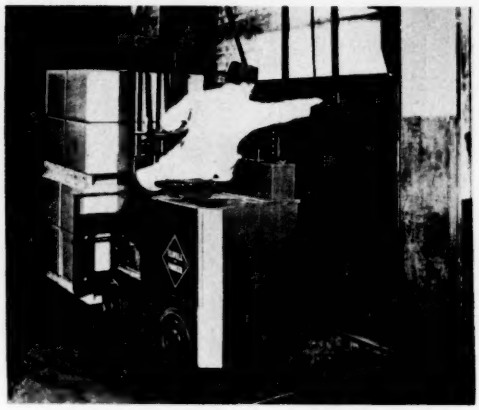
To meet the needs of users of power industrial trucks, special elevators have been developed in standardized sizes. In the early days of industrial trucks, it was necessary to treat each elevator installation for power truck use as a custom-built, special engineering problem. However, standardization of the characteristics of most industrial trucks has made possible the standardization of elevator design, with a consequent lowering of manufacturing and installation costs.

In the line of power truck elevators made by Otis Elevator Co., the following are the most commonly specified sizes and capacities: Capacities, 8,000 10,000, 12,000, 14,000, 16,000, 18,000 and 20,000 pounds; platform sizes from 8 ft. 4 in. by 10 ft. to 12 ft. 4 in. by 16 ft.; clear door openings are all 8 ft. high and range from 8 ft. to 12 ft. wide. Other sizes and capacities are available.

Everything about these elevators is designed to meet the punishment of industrial trucks—platform, flooring, car frame, diagonal bracing, guide rails and their supports, and the hoisting machine. Automatic self-leveling is a "must" to eliminate additional strain resulting when a power truck rolls onto the platform that is slightly above or below the warehouse floor level. When the concentrated front wheel load of the truck stretches the hoisting ropes and pushes the car down, the self-leveling device brings the platform back flush with the floor.

Conversion of Existing Elevators

Full collective control provides automatic operation of these elevators by the truck driver or any other employee. Overhead push-button landing fixtures are often suspended above the traffic approach to the elevator to save truck driver time in summoning the elevator without leaving his truck. Where heavy traffic prevails, an optional-attendant feature can be provided. This allows an attendant to operate the elevator during busy periods with a resulting saving in truck drivers' time, and yet the elevator can be operated by any passenger during slack periods.



Control buttons on the new Otis Pow-R-Truck elevators are in easy reach of the operator of an industrial truck and these elevators are especially designed to resist the forces set up by sudden stops and off-balance loading encountered with power truck materials handling.

Most existing elevator installations in cold storage warehouses can be converted for use with power industrial trucks by a few or all of these steps: Strengthen car platform to withstand heavy concentrated wheel loads; strengthen side bracing of the car; add rigidity to the car-frame to counteract the twisting effect of off-balance loading; check sheave shafts, sheaves, brakes, hoist ropes, car safeties, etc., against the increased weight of the heavier car and the probable over-load caused by front wheels of the truck running onto the partially loaded platform.

Heavier Hoistway Construction

Heavier hoistway construction may be required, such as heavier guide rails, fastenings and brackets. If floor heights are excessive, it may be necessary to strengthen the building structure adjacent to the hoistway. This is because the rotational forces caused by industrial truck loading become horizontal forces on the guide shoes, rails and rail brackets and are transmitted to parts of the structure to which the rail brackets are fastened. Strength of guide rails depends upon gross weight and must be adequate for the car safety to hold without tearing out the guide rails. Another factor governing guide rails is the type of loading. In the case of an especially wide car platform, for example, most of the strain is put on one rail if the elevator is loaded with a typical narrow-gauge industrial truck.

Since materials handling with industrial trucks so greatly increases the stresses placed on elevators not designed for such use, conventional elevator equipment can be quickly damaged and its operation can even become dangerous.

Explosion Damages Memphis Freezer Plant

AN EXPLOSION in the engine room of the Tennessee Quick Freezing and Storage Corp. plant in Memphis blew out a temporary side wall of corrugated metal on wood framing and littered adjoining offices with broken glass. No one was injured for none of the workers in the plant had arrived for work. The explosion occurred at 7:30 a. m. April 19.

The plant is said to contain 300,000 cu. ft. of storage capacity divided into one large and two small freezer rooms. The engine room is in two sections, the original portion containing three ammonia compressors, condenser, receiver and other equipment including a gas-fired forced air heater with thermostatic control. Another section of the engine room is adjacent to the first, formed by closing in a portion of the plant platform with corrugated metal as mentioned before.

At the time of the explosion most of the plant was shutdown but a 6½x6½ vsa machine was reported as operating on automatic control. After the explosion, inspection of this machine showed that it had cracks in the cylinder block which extended through the water jacket and compressor cylinders. Cylinder head stud bolts had also been broken off or pulled out.

It was suggested that the machine might have been damaged by a heavy slug of liquid. After the ammonia was discharged into the room by the break in the machine, it was thought that the vapor might have been ignited by the flame in the gas heater. None of the ammonia pipes, connections or equipment broke open when the explosion occurred, but the force of it passed through the window and door and blew out the enclosure along the platform.

Port of New York Warehouses Face Strike May 31

A STRIKE which would tie up inland dry storage and cold storage warehouses in the entire Port district of New York is threatened at the end of the month, according to late news reports. With the current contract between the warehouses and Local 818 of the International Brotherhood of Teamsters & Chauffeurs (AFL) expiring May 31, union officials are asking for a 35 cent an hour wage increase in addition to fringe benefits which industry leaders say they are in no position to meet in view of recent drastic declines in the occupancy rate and the increasing competition of other lower-cost storage facilities in other North Atlantic ports.

The New York State Mediation Board has stepped into the controversy and has held a preliminary meeting with both sides but reports indicate that the union has shown no disposition to yield in its demands. The warehouses are being represented in negotiations by a committee of the Warehousemen's Association of the Port of New York, headed by Elwood W. Ford of the Baker & Williams Bonded and Free Warehouses with Harry L. Gutter as counsel.

The present basic pay in inland warehouses in the port district is $1.35 an hour. The union is asking that this rate be raised to $1.70 an hour and that checkers' pay be raised from $1.40 to $1.87½ an hour, with the present 5 cents an hour differential for cold storage warehouses maintained. In addition, the union is asking for new job classifications for licensed maintenance operators at $2.12½ an hour, with helpers at $1.87½ an hour. Demands also include a health and welfare fund to be financed by a 10 per cent assessment on the gross weekly pay roll and extended vacations.

Refrigerated Warehousing Industry

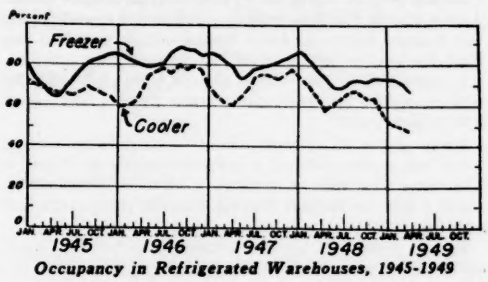
Cold Storage Holdings—Freezers Decline Coolers Remain Unchanged

PUBLIC freezer space was 64 per cent filled on April 1, the lowest it has been for this time of year since 1943. During March occupancy declined 4 points, whereas the average decline from March to April was 3 points. Compared with the average April 1 occupancy, for the 5-year period ended 1948, freezers are operating at 14 points below average.

Cooler space was reported being 48 per cent filled which compares with the average April 1 occupancy of 67 per cent and 59 per cent reported this time last year. There was no change since last month in the national average although several regions did show slight gains in cooler occupancy since March 1; the Middle Atlantic and Pacific regions each showed a 3 point decline in cooler occupancy.

TABLE I—COLD STORAGE HOLDINGS IN PUBLIC WAREHOUSES—BY COMMODITIES (000 OMITTED)

	April 1, 1949	March 1, 1949	April 1, 1948	Five-year Average
Meat and meat products, lbs.	856,702	903,050	967,732	790,315
Lard and rendered pork fat, lbs.	159,659	179,628	129,028	160,157
Frozen poultry, lbs.	108,677	131,496	205,745	215,689
Creamery butter, lbs.	6,324	8,718	3,482	27,635
American cheese, lbs.	105,258	111,073	90,469	91,456
Other cheese, lbs.	12,565	13,237	10,745	15,877
Shell eggs, cases	514	144	1,165	2,336
Frozen eggs, lbs.	77,764	58,621	143,253	131,011
Apples, bu.	5,474	9,028	10,244	7,674
Frozen fruits, lbs.	266,423	301,249	281,762	265,194
Frozen vegetables, lbs.	205,618	229,506	196,628	170,080
Frozen fish	83,632	104,138	76,743	66,410



Occupancy in Refrigerated Warehouses, 1945-1949

April 1 holdings of foodstuffs in storage totaled 2.8 billion pounds. Cooler held commodities reduced by 11 per cent since March 1 amounted to 1.4 billion pounds. Last year this time, foodstuffs in coolers totaled 1.6 billion pounds. Net withdrawals during March of fresh, dried, and evaporated fruits were counter-balanced by the into-storage movement of nuts, nutmeats, shell eggs, and dried eggs. All freezer held commodities, except frozen eggs, showed seasonal decreases during March. The net withdrawal of 156 million pounds, or 10 per cent of the stocks in storage last month, placed April 1 holdings at 1.4 billion pounds. Freezer stocks last year this time amounted to 1.6 billion pounds.

TABLE II—PERCENTAGE OF SPACE OCCUPIED BY PUBLIC COLD STORAGE WAREHOUSES (APPLE HOUSES EXCLUDED)

	Net Piling Space (000 cu. ft.)		April 1, 1949 (%)		March 1, 1948 (%)		April 1, 1948 (%)		5-Year Average (%)	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	3,561	6,327	37	64	35	70	58	65	67	67
Middle Atlantic	42,086	33,798	41	59	44	62	55	72	64	81
East North Central	36,040	28,304	51	64	50	69	58	77	66	78
West North Central	11,006	16,733	54	74	50	83	69	88	71	77
South Atlantic	11,634	6,368	50	79	49	81	63	79	70	85
East South Central	4,199	3,847	65	85	58	88	70	78	80	77
West South Central	7,241	5,195	73	60	68	65	66	69	74	76
Mountain	2,150	2,707	57	70	40	59	74	87	80	88
Pacific	18,936	21,462	44	54	47	58	61	67	65	71
United States	136,853	124,741	48	64	48	68	59	75	67	78

Private and semi-private warehouses reported coolers 47 per cent occupied and freezers 57 per cent, while meat-packing plants showed little change since last month with coolers and freezers, being 89 and 81 per cent filled, respectively. Public general warehouses in key cities were above the national average for cooler and freezer occupancy with 52 and 65 per cent, respectively, reported occupied by foodstuffs in storage.

Creamery butter, which totaled 6 million pounds, was almost twice the amount reported in storage on April 1, 1948. Withdrawals during March only amounted to 2 million pounds which compares with an average withdrawal

TABLE III—PERCENTAGE OF SPACE OCCUPIED BY PRIVATE AND SEMI-PRIVATE REFRIGERATED WAREHOUSES AND MEAT PACKING PLANTS

	Private and Semi-Private Warehouses						Meat Packing Establishments					
	Net Piling Space (000 Cu. Ft.)		Space Occupied—Per Cent April 1, 1949		Space Occupied—Per Cent March 1, 1949		Net Piling Space (000 Cu. Ft.)		Space Occupied—Per Cent April 1, 1949		Space Occupied—Per Cent March 1, 1949	
	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer	Cooler	Freezer
New England	554	1,133	30	79	31	73	1,968	725	88	100	81	.....
Middle Atlantic	3,293	4,430	36	52	38	55	6,731	740	78	64	85	69
East North Central	5,779	2,576	80	53	73	59	15,885	6,591	89	62	91	75
West North Central	2,123	3,929	72	75	74	78	25,718	10,549	90	86	91	88
South Atlantic	647	1,377	17	72	16	75	2,377	609	95	98	95	99
East South Central	190	101	100	.....	.....	.....	2,014	403	84	89	48	88
West South Central	700	764	37	14	24	8	3,570	1,452	100	98	100	100
Mountain	182	654	84	39	81	47	2,028	666	98	100	96	99
Pacific	5,383	6,554	15	52	12	59	4,056	1,152	94	97	96	93
United States	18,851	21,498	47	57	44	61	64,347	22,887	89	81	90	82

of 7 million pounds and 4 million pounds withdrawn from storage last year this time.

The into-storage movement of shell eggs finally got under way during March. April 1 holding of shell eggs at 514,000 cases reflected an in-movement of 400,000 cases. Half as much moved into storage than last year this time, and was a million cases below the average March to April increase.

Frozen egg stocks increased by 19 million pounds and on the first of this month totaled 78 million pounds. About a sixth of the total stocks on hand were Government owned. Dried eggs in storage totaled 35 million pounds, of which 30 million pounds were held for the account of Government agencies.

Frozen poultry stocks were reduced by 23 million pounds during March. Net withdrawals were 50 per cent less than the average March to April change and 60 per cent less than the poultry withdrawals last year. Poultry in storage amounted to 109 million pounds compared with 206 million pounds last year and average April 1 holdings of 216 million pounds.

Fresh apples in storage, reduced by 4 million bushels since last month, totaled 5 million bushels on April 1. This compares with an average of 8 million bushels on April 1 and 10 million bushels reported in storage last year this time.

Frozen fruits totaling 266 million pounds were about equal to the average April 1 holdings for the 5-year average but were below the stocks of last year. Last month 35 million pounds were withdrawn from storage which, while 6 million pounds greater than the average March to April change, was equal to the withdrawals during March 1948.

Frozen vegetables exceeded the April average holdings by 36 million pounds. The 206 million pounds in storage April 1 reflected a withdrawal of 24 million pounds since March 1. Last year this time 30 million pounds were withdrawn during March, whereas the average net change was 21 million pounds. Frozen peas, reduced by 11 million pounds since March 1, totaled 62 million pounds on April 1; frozen lima beans, 25 million pounds above average April 1 stocks, totaled 37 million pounds.

Total meats in storage amounted to 857 million pounds on April 1. The items and quantities are as follows: total beef, 128 million pounds; total pork, 581 million pounds; other meats, 148 million pounds. Beef stocks were 12 million pounds less than quantity on hand last month; normally stocks increase during this time of year by 4 million pounds. Pork holdings, down 30 million pounds since March 1, were above average April 1 stocks by 66 million pounds. Lard and rendered pork fat moved out of storage during March by 20 million pounds, leaving 160 million pounds on hand April 1. This compares with an average March to April change of an increase in stocks by 6 million pounds.

On April 1 frozen fishery products in storage amounted to 84 million pounds, a net decrease in stocks of 20 million pounds since March 1. Stocks on hand were 18 million pounds greater than the average April 1 holdings and exceeded last year's stocks by 7 million pounds. Miscellaneous fillets totaling 18 million pounds accounted for a fourth of the stocks moved from storage.

Storage Outlook

During the first quarter of 1949, public cooler occupancy averaged 51 per cent of the first of each month. At the start of the second quarter only 48 per cent of the net- occupiable space in coolers were used for food storage. The upswing in cooler occupancy expected during March—the 5-year average indicates a point increase—did not materialize, instead occupancy remained unchanged from last month. Beginning with January 1 last, the decrease in occupancy each month indicated that the seasonal changes are occurring about a month later than the 5-year average would indicate. Although the average April to May increase in public cooler occupancy is 3 points, because of the lag, occupancy may only rise one point during the month if the present trend should prevail.

April 1 occupancy in public freezers of 64 per cent indicated that utilization of freezer space was 14 points less than was reported on April 1 for the 5-year period ended 1948. Since January last, the range between first-of-the-month occupancy during 1949 and the corresponding 5-year monthly occupancy has increased from 12 points to the 14 points reported last month. During March there was a 4 point decline in ocupany which was greater than is normally expected, however, the net into-storage movement of frozen eggs should counter-balance the withdrawals of other freezer items so that the rate of decline in freezer occupancy expected during April should be no more than average—a decrease of 2 to 4 points.

Cold Storage Stocks of Frozen Fruits and Vegetables

THERE were 86 million pounds of frozen peaches, raspberries and strawberries in storage April 1. Stocks classified as to container size amounted to 61 million pounds or 71 per cent of the stocks on hand. Almost a fourth of this amount was reported to be in packages of 1 pound or less. There has been little change in the percentage of 1 pound packages reported since October 1948. On April 1, 31 per cent of the peaches, 11 per cent of the raspberries and 26 per cent of the strawberries were in retail packages, compared with 31 per cent, 12 per cent and 28 per cent reported for these same items last month.

Cold Storage Stocks of Frozen Fruits and Vegetables in Storage April 1 and March 1, 1949 in Packages of One Pound or Less (000 Omitted)

	April 1, 1949		March 1, 1949	
	Lbs.	Pct.	Lbs.	Pct.
Peaches	3,198	31	3,758	32
Raspberries	1,540	11	1,944	12
Strawberries	9,522	26	12,875	27
Asparagus	1,025	51	1,387	49
Beans, lima	12,219	61	13,793	56
Beans, snap	5,818	68	6,805	71
Corn, sweet	5,914	55	4,743	51
Peas, green	21,757	64	24,710	62
Spinach	3,659	73	2,443	72

Packaging data for the six frozen vegetables in storage April 1 covered 54 per cent of the stocks on hand. Commodity coverage was unchanged from last month, but this time last year 64 per cent of the stocks in storage were classified as to package size. The portion of spinach in storage in one-pound containers comprised 73 per cent of the stocks on hand; this time last year this percentage was 65 per cent. Proportionately, more of the frozen asparagus, lima beans, sweet corn, and green peas were reported in one-pound containers on April 1 than last month. It would thus appear that the withdrawals of these vegetable items in the larger sized containers exceeded the out of storage movement of consumer sized packages. Frozen snap beans was the only vegetable item to show a decrease in the ratio of retail packages to total stocks classified. On April 1, 68 per cent of the stocks classified as to container size were reported in retail packages compared with 71 per cent reported last month.

The Ice Industry

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Automatic Ice Cubers—How to Meet Their Competition

By Arthur M. Stoker

City Ice Delivery Co., San Francisco, Calif.

The ice industry has lost some good customers to the automatic ice cube machines, and this competition is felt particularly in sections where ice distributors have done a good selling job. This report does not attempt to give all the answers but it does offer some suggestions on ways and means of meeting this competition.

FOR a good many years we worked very hard and spent a lot of money developing the sized ice business and the cube ice business, and we felt we had done an excellent job. We encouraged everyone to use lots of ice for every purpose that was practical. We went along, and we had our market pretty well covered. We were really rendering a service.

I don't think that there is any question about the quality of the product that we were handling in our area. It was a good product, handled under sanitary conditions. The facilities that we have, in plant and manufacturing facilities, definitely disprove any argument on that point. I'm sure that our product is equal to or surpasses any product which is placed before the customer in this line.

We did find, though, that you must do more than just furnish a good product and good service. It's possibly true that we had just gone along in our own little way and figured that those accounts were sold. We had seen that they had the equipment to handle our product, and we believed, that that was all we had to do. We figured that it was necessary only to give them a good product and good service at a fair price.

However, we found out another thing. We found that when anyone can contend to your customer that he can save him money and convince him that there are advantages in using some other method or some other product, you very probably will lose out. If we can get to the customer before the machine salesmen and discount their sales talk and cost savings analysis, we will have nothing to worry about. There are such things as plumbing problems and electrical installations which the salesmen conveniently overlook.

Get to the Customer

Now, there are many things that can be done to combat these machines, and we're doing our utmost to see that these things are done. We don't know all the answers, of course, and I wish we did. The main problem is that of when to get to that customer. Obviously we can't go out (at least we don't feel we should) and contact all our customers and tell them about all the disadvantages of purchasing an automatic ice maker. That would only suggest to them the natural question, "What do those fellows have that has the iceman so excited?"

Well, frankly, they don't have a great deal that excites us if we can just reach the customer at the right time. Anything can be done if it is done at the proper psychological moment, I'm told.

Now these ice maker salesmen don't hesitate about calling on our customers. They are not as much interested in trying to go out and build up new users of ice as they are to call on the current market. They're after our bread and butter, and they are bringing down our revenue. We try to get around among all our customers. We keep in touch with their requirements by having our representative in their places every day or every other day.

Recently we started to make a survey, and we hadn't gone very far before we realized that some of the things that we discovered in our own customers' places of business were startling. We had sold them equipment which was the best available at that time. Then in some cases we hadn't bothered to see that it was kept up properly with repairs and proper maintenance, and we hadn't bothered to see that the equipment was functioning properly or that it was adequate and that it wasn't something that the customer didn't need. We just figured that a customer was good for say 400 pounds a day, and we just automatically delivered it there, without making it our business to see that the ice was economically handled and used.

We didn't stop to realize that things that cut down our customer's profit had to be passed on to his customers. We didn't stop to think that extravagant waste would affect his sales the same as it would affect our own sales. We didn't bother to see how he was using the equipment, and whether he was using the proper product for the proper job.

Excerpt of paper presented at annual convention of California Association of Ice Industries.

We found customers doing such things as using cubes to cool beer and vegetables and fish and butter. We found a number of instances where they had the old 1½ or 1 inch galvanized iron pipe coils in their cube chests. Many of them were cooling water that they weren't using for table service at all. We found many things that we should have taken the time previously to find out. We do know those things now, but only after we had been prodded by necessity.

Ice Cuber for Demonstration

There is a question as to whether or not the iceman should own and operate an automatic ice cuber in his own place of business so that he can demonstrate it to customers. He would then have the customer on familiar ground where he could actually go into the differences between buying our product or a substitute. Without a question of a doubt, I think that we can convince anyone that they are much better off by using the services and products that we have to offer instead of buying a little ice plant of their own and trying to go into the ice business in their own basements.

Another question is whether it's going to be necessary for us to own and maintain certain equipment in the business place of our customer so that we can supervise and sell the customer on the idea of keeping the equipment that he needs in the proper shape in order to save himself money and stop any needless waste. That's another question that we are considering at the moment.

Another thing, and this is something we have done in a lot of cases, is to develop special equipment to utilize our products. We furnish the customer with such things as buckets and scoops and various articles for his convenience, at cost.

One of the hardest and yet most important things that we have to do now is to call upon our customers regularly and take an interest in their problems. If the story is put to the customer properly and factually, I don't think there are many who wouldn't be interested in paying a reasonable sum for the service rendered. That covers a lot of different situations.

The bartender is usually our friend. We have a lot of friends, as you know. One of them recently took the trouble to look us up on his day off and tell us that things looked "hot" down at the place where he worked. We went down to the owner to try to outsell a cubing machine, and we were successful. It is pretty hard to know who you're talking to sometimes, and you may not have the right party at all. However, if you can actually get to your customer at the right time, you have nothing to worry about.

Another thing to think about is whether we are really as interested in our customers as we should be. That's a very important point. If we are interested in our customers as we should be, and if we are doing the job conscientiously and honestly in the manner that the customer thinks the job should be done, we at least have our head in the door along with our feet.

Grocers Meet with Ice Distributors

A MEETING sponsored by ice distributors of Enid, Okla., was held at the Youngblood Hotel recently at which more than 100 grocers of Enid and the northwestern area of Oklahoma were present. The modern marketing methods employed in the use of crushed ice for fresh fruits and vegetables in retail stores were explained and demonstrated and the ice industry film, "Naturally Yours," was shown.

Ice Dealers Need Sales and Service Training—Tools Available

A BULLETIN has been issued by the Personnel Training and Marketing Department of the National Association of Ice Industries calling attention to the need for training ice dealers, commonly known as peddlers. There are a number of ice companies, it points out, that have recognized the importance of that work and have helped their retail representatives to become more competent business men. One manager put it this way:

A Manager's View

"When I took over this business I started right in to sell our dealers on the value of uniform service as a means of increasing the cash value of their routes. I pointed out that in his route each man had a capital asset which was exactly the same as a piece of real estate or some other tangible property, and that everything he did to build up the good-will of his customers and to add to their number was just like putting money in the bank, because it was making that route a more valuable property.

"I pointed out that I had been in the ice business a good many years and had made a study of the different factors that went toward making more profitable ice route operation, and I suggested that we work out a list of rules based on these factors, which could be accepted and lived up to by both them and the company. They liked the idea—so the rules were worked out and the men voted to accept them and to live up to them. The men have stuck to their bargain and these rules have become more or less a standard by which any man who buys a route from another has to agree to before the deal can be consummated.

"My whole idea was and still is to instill in the men a pride in their jobs and a consciousness of the fact that they have a business of their own which they can be proud of, and which it is to their advantage to conduct in the most modern up-to-date way. Of course, it requires continuous selling on our part, and in all my contracts with them, whether individually or in a group, I try to use different ways of reminding them of the fact that they are substantial business men."

The Dealer's Side

The reaction of an ice dealer himself to practical sales training is told in the following statement made by one independent dealer:

"A few years ago when we first got these modern ice refrigerators, I thought it was crazy to try to sell them. The ice company started to hold meetings and wanted us to come to them and learn how to sell. Well, I thought it was the craziest thing I'd ever heard of but I found out I was wrong. I went to a few of these meetings and they were just so full of common sense that I wondered myself why I had any customers left, and I began to see why we should give better service and I began to realize why I had so many electric refrigerators on my route. Since then, I have attended practically all the meetings and I can't think of any that I didn't get some good out of that I could use."

The National Association has sufficient tools immediately available for this training. One tool is a 30-minute sound-slide film called, "Times Have Changed," which was produced specifically for training dealers. It shows most of the dealer's difficulties and suggests remedies. A Manager's Manual for using the film is furnished. Other tools available are the extensive illustrated training course, "Modern Practices in Ice Delivery Service" with Manager's Manual, a "Service Manual for Modern Icemen," and a safety manual, "One Way—The Safe Way."

Timmons New Publicity Director for National Ice Association

TAKING the place of Robert Harper who resigned recently, Francis X. Timmons has joined the staff of the National Association of Ice Industries, as director of advertising and publicity. Before taking on his new assignment, he was copy director for a prominent Washington advertising agency. While there, he handled regional and national accounts in an account executive capacity.

Mr. Timmons has a broad background in the advertising field, having an excellent knowledge of production, research, market and media analysis, and in public relations. He has worked as a commercial artist for printing companies in New York and New Jersey, was advertising manager for a large New York and New Jersey, was advertising manager for a large New York food distributor, and for over two years was assistant promotion manager of The Washington Post. He spent five years in the Army and was separated as a Captain in 1945.

Francis X. Timmons

He was educated in the Jersey City grammar and high schools and attended Pratt Institute in Brooklyn, N. Y. He is married, and resides in Arlington, Va.

New Ice Advertising for 1949

PROOFS of some of the new 1949 ice advertisements all directed toward creating and building consumer interest in ice refrigeration have been issued by the Public Relations Department of the National Association of Ice Industries.

One of the early general magazine advertisements appeared in the May issue of Good Housekeeping in full color featuring peas "kept garden fresh, vitamin rich with crushed ice." Another general magazine advertisement appearing in the May Good Housekeeping, the June Women's Home Companion and the July Pathfinder features a modern ice refrigerator and tells why and how it is best for preserving food. This advertisement also appears in full color.

Following up last year's program of trade paper advertising a "catchy" full-page advertisement on the big profit possibilities of merchandising fresh produce the ice way, will appear in grocers' papers including Chain Store Age, Cooperative Merchandiser, Food Topics, National Grocers Bulletin, Super Market Merchandising, Voluntary and Cooperative Groups Magazine, Progressive Grocer and Independent Grocer.

The restaurant and beverage trade will be reached by advertisements on ice cubes in American Restaurant, Beverage Bulletin and Chain Store Age.

Cold War Ends in Cooler

TWO men were arrested at Baton Rouge, La., on an ice company's complaint that they were conducting their own cold war. A dismissed iceman and a friend were accused of turning signs in windows to read, "No Ice Today."

Northwest Ice Men Show Ice Booth at Restaurant Exposition

A DISPLAY booth pointing out the advantages of ice for use in restaurants was shown at the convention and exposition of the Washington State Restaurant Association held at the Olympic Hotel, Seattle, early in April. The booth was installed through the joint efforts of the Washington members of the Northwest Association of Ice Industries.

It was well located and while the hundreds of people who visited it and stopped to observe and discuss the use of ice were not counted it seemed to the attendants an endless parade while convention sessions were not under way.

On the background drapes of the booth was a big multicolored sign which read "MerchandICE with Genuine ICE—Sized and Cubed for Bar and Restaurant," with the word "Ice" emphasized by color contrast. On one side of the booth was a bar with large bowls of sparkling cubes, glasses and decanters of apple juice. A professional bartender served what looked like highballs but which was apple juice, poured over ice cubes while he talked to the "customers" about the advantages of two cubes of genuine ice in a highball.

On the other side of the booth was a specially built display tray about 5 ft. long, 2 ft. wide and 6 in. deep filled with sized ice. Embedded in the ice were oranges, apples, glasses of various fruit juices, plates of salads, relishes, etc. On the end nearest the aisle was a big glass tray heaped high with sized ice and generously covered with shrimp on toothpicks. Of course there was a bowl of cocktail sauce in which to dunk the shrimp.

A very attractive girl in immaculate uniform kept the display fresh and crisp and invited people to have a shrimp while she talked to them about the attractiveness of foods served with sized ice. Interested bar and restaurant operators were given a very beautiful multi-colored pamphlet on the use of sized and cubed ice (Frozen Diamonds) in bars and restaurants.

Special guests were given a card of invitation to visit a hospitality room on the third floor of the hotel between the hours of 9:30 and 11 p.m. The same girl and the same bartender were in charge there to serve the refreshments.

While the cost of this project was somewhat substantial, it was an interesting experience, generally conceded to be well worthwhile from the standpoint of creating interest in ice refrigeration and Washington ice men expect to use it as a guide for similar future efforts.

Detroit Ice Companies Go Television

SIX OF the leading ice companies in metropolitan Detroit have inaugurated a cooperative movement to acquaint their public with ice and its many uses through a television program. This program started on Monday, May 16, and will continue for 13 weeks. Each program will consist of televised spot announcements as follows:

WWJ-TV: Wednesday, 7:30 p.m.; Saturday, 8:30 p.m.

WJBK-TV: Tuesday, 9:29 p.m.

WXYZ-TV: Monday, 8:14 p.m.; Tuesday, 10:45 p.m.; Thursday, 10:15 p.m.

The programs are being financed solely by the participating companies, and all televised broadcasts instruct the listener to contact his local ice company in Detroit. This will identify the program to the industry and not to any particular company. The program has the backing of every ice company in Detroit, Mich.

This is the first venture of its kind in the ice industry and its results will be watched with keen interest by other ice distributors.

City Products Corp. Re-elects Sinek

AT a meeting of the board of directors held April 21, William J. Sinek was re-elected president of the City Porducts Corp., formerly known as the City Ice & Fuel Co. The action followed reelection of the board and adoption of the new company name by the stockholders at their annual meeting. The new name is effective immediately. In cities where the company has operated as The City Ice & Fuel Co., it will be known for a time as City Ice & Fuel Division of City Products Corp.

Wm. J. Sinek

City Products operates the largest chain of cold storage warehouses in the world, fourteen in all. Extending from Arizona to New Jersey, they serve many of the great food producing centers in the country and are in a position to handle much transcontinental movement of food. Combined capacity of the warehouses is more than 22,000,000 cu. ft., and hundreds of food products are handled.

The company is the largest ice company in the world. Its plants are located in many of the most important cities of the middle west, and a large number of the growing cities of Florida.

Mr. Sinek's re-election was an endorsement of his diversification program, which has produced an increase in net sales from approximately $25,000,000 in 1940 to nearly $80,000,000 in 1948. Because of extensive activity in such varied industries as manufacture and distribution of ice cream and dairy products, brewing, car icing, cold storage warehousing, and locker plants, in addition to its ice and fuel business, the old name did not properly reflect the company's diversified products and interests.

Present activities of City Products include dairy plants and distribution facilities in seven states; 14 cold storage warehouses; four breweries; a plant for the manufacture of ice refrigerators and air conditioning units; 10 locker plants; and 169 ice manufacturing plants, with a daily capacity of nearly 24,000 tons. Operations are conducted in 27 states, Canada, and Mexico, and serve more than 165 cities and metropolitan areas.

In other actions, Harry Strong was promoted to chairman of the board and Thomas J. Beck was elected to the presidency of Midwest Dairy Products Corp., Chicago, a City Products division. Mr. Strong also will assume new duties with the parent company.

"Continued and aggressive diversification of our activities will remain our business policy," William J. Sinek declared. "The officers of this organization are intimately familiar with the market in which we operate. We should, and will, continue to take full advantage of their direct and unusual knowledge of our relationship with the consumer and his needs."

City Ice Plans New Sales Promotion

A TWO day conference type meeting of all City Ice retail division managers was held in the Chicago office of the City Products Corp., formerly City Ice & Fuel Co., on April 25 and 26. William A. Schmid, vice-president in charge of the company's retail ice operations, presided.

Monday was taken up with a discussion of operating problems and plans were laid for an aggressive sales campaign of ice in all its forms, the theme being that ice can and must be actively sold the same as any other commodity.

On Tuesday, the necessity of sales and personnel training was stressed by Robert W. Croker of Cleveland. He pointed out that it was one of the most important activities of his division and was one of the activities most necessary in order to provide the drivers and other employees with the information and tools with which to work.

George V. Warren, merchandising manager, then presented a new ice appliance merchandising program with a method of developing prospects from the ice drivers with an incentive for the driver's efforts. This "new approach" is tied into a direct mailing program into the homes of all employees offering prizes for prospects and sales.

Ice Posters for Outdoor Advertising

TO help local ice distributors promote the ice business in their sections, the Public Relations Department of the National Association of Ice Industries has ready a series of four 24-sheet billboard posters with full color illustrations. These advertisements carry a definite sales appeal under the headline "Ice Does it Best, and telling "how" in four different sales angles: "All you want when you want it"; "Keeps drinks colder," "Keeps foods fresher in stores" and "Keeps foods fresher in homes." They also are made up as blotters measuring 3½ x 6¼ inches.

How Clancy The Iceman Has Changed!

BY FRIGID BRIDGET

It might be said that Clancy
In days gone by, was rough
And that he was past-master
In peddling out the guff.
His demeanor and his product
Were far from being pure
In fact the very air about him
Was frightful to endure!

His speech was distasteful,
Likewise the way he attired;
Indeed Clancy's acquaintance
Was not to be desired.
The jokes he evoked were revoltin'
Although they were the style,
And never failed, you bet
To lay folks in the aisle!

But those days are gone forever
As far as Clancy's concerned,
He's become a model man,
A goal he so justly earned!
His tailored uniform is neat
With a nifty cap to enhance,
And now when folks "pipe" Clancy
They steal another glance.

He's now convincing in that
There's nothing like ICE
(All things considered—
Loss from spoilage and price)
To protect and retain vitamins
In vegetables and fruits.
"Just try Ice," says Clancy,
"To eliminate the droops."

It is true the modern iceman
Has poise and assurance
And that research has
Wielded its fine influence,
But the iceman of old
Really met his doom
When Clancy got wise
And lowered the boom!

Among other things he has
Learned sales merchandising
Also the keen value of
National ice advertising;
And now to increase his knowledge
Clancy's become a recruit
In the renowned National
Ice Marketing Institute!

Dr. John Gorrie Honored—Story of Ice Machine in Textbook

ADDITIONAL recognition is being accorded Dr. John Gorrie for his work in designing the first American ice making machine according to a feature story in a recent Jacksonville, Fla., newspaper.

Through the efforts of Mrs. Laural Buxton Hobbes, who teaches English at the John Gorrie Junior High School, Jacksonville, Fla., the story of his life is to be taught in public schools. Mrs. Hobbes became interested in the man for whom the school was named and as a result of this research she wrote an article entitled, "John Gorrie, An Unsung Benefactor." Scott, Foresman and Co., of Chicago, publisher of the "Literature and Life" series of textbooks has accepted this article and will include it in the next revision of these text books for ninth grade students.

When she began her research, Mrs. Hobbes found that nothing about Dr. Gorrie was included in the Encyclopedia Britannica. Thinking this to be an oversight, she wrote the Britannica publishers, but did not receive a satisfactory reply. She then got endorsements of Dr. Gorrie from state officials and Florida's Congressional delegation. The encyclopedia publishers still were not interested.

In 1941 she prepared a resolution which former State Senator J. Turner Butler put through the Florida legislature calling on the Encyclopedia Britannica to include a biography of Dr. Gorrie. That did the trick and the unusual move resulted in a reply from the encyclopedia publishers which included the comment that "never before in the 173 years of Britannica's history has the Encyclopedia Britannica been enjoined by the legislature of a state to include a biography of an illustrious native son."

Mrs. Hobbes is also working on a move to place Dr. Gorrie in the Hall of Fame at New York University. Pupils of John Gorrie Junior High school have been circulating petitions endorsing the move and Mrs. Hobbes has written influential people asking for their support.

A number of honors already have gone to Dr. Gorrie. In 1914 the state of Florida had a statue placed in Statuary Hall, State Capital Building, Washington, D. C. There is also a monument to him in Apalachicola where he invented the ice machine. A five-mile bridge across Apalachicola Bay bears his name and a Liberty ship built at Jacksonville during World War II was named for the doctor.

Dr. John Gorrie was born in 1802 on the island of St. Nevis in the West Indies and came to this country when one year old. In 1833, he moved to Apalachicola and became a resident physician in the Marine hospital there. In his treatment of fever-stricken patients, he found that sleeping in cooled rooms gave them relief. This led to devising an air conditioning apparatus in 1844, and this in turn led to development of a machine for making ice. On May 6, 1851 he obtained a patent on it,—the first known ice-making machine. He was unable to obtain financing for his invention and he died July 29, 1855 without seeing any practical result come from it.

Grand Rapids Ice Business Sold

THE ICE business of the Collins Ice & Coal Co., Grand Rapids, Mich., has been purchased by the City Ice & Fuel Co. The Collins Ice business will be consolidated with the Consumers Ice Co., a subsidiary of the City Ice & Fuel Co., at 63 Market St. S. W. H. W. Collins, president and general manager of the Collins concern, in announcing the sale, stated that his company expects to expand their present coal business and to further expand and develop their present storage facilities to include cooler storage, dry storage and freezer storage.

R. L. Lindsey Honored For Long Service

TRIBUTES in the form of speeches and gifts were heaped upon Robert L. Lindsey, branch manager of the Duke Power Co., at Durham, N. C., at a testimonial dinner in his honor April 22 at the City Armory by employees of the local organization. The occasion was Mr. Lindsey's 50th anniversary of service with the company at Durham.

Approximately 600 people attended the dinner, many of them associates of many years; and men who had received their basic training in the field of utilities under Mr. Lindsey came from distant cities to attend the dinner. He received a silver pitcher and ice bucket and a set of goblets from the local branch of the International Brotherhood of Electrical Workers; a leather-bound volume of letters written by his business associates and friends, and a large silver tray suitably engraved from the 280 employees of the company in Durham.

Mr. Lindsey's career in the ice industry started in 1901 and he continued as manager of the Durham ice properties which had been owned by several companies including the Duke Power Co., until that company sold the properties in 1944. He served his city and community with distinction and honor to himself, his company and the ice industry for a period of 43 years. He also served the North Carolina Ice Association which was organized more than 40 years ago in many capacities—as president, vice president on two occasions, as director several times and as secretary and treasurer for many years. Being well versed in bookkeeping and auditing, he developed an accounting system that was widely used by members of the ice business in North Carolina.

Better Ice Service Club Meets

MEMBERS of the Better Ice Service Club, Odessa, Tex., heard reports of the Southwestern refrigeration engineer's conference held in February at College Station at their regular bi-weekly meeting held in the office of the Permian Ice Co.

Appearing on the program were engineers J. W. Baker, Permian Ice Co., Odessa; T. F. Shipman, Permian Ice Co., Monahans; and Parker Elkins, Community Public Service Co., Pecos. A report was also given on the merchandise sales contest between employes of the ice companies. Burton Scown and Ben Dancer, both of Odessa, who took an early lead in the contest, are still ahead by a wide margin.

Forty-six members from ice companies in Odessa, Monahans, Pecos, Kermit and Fort Stockton were present. E. R. Bryan, Odessa, president, presided.

"Queen for a Day" to be Awarded New Ice Refrigerator

THE Ice Cooling Appliance Corp., Chicago, Ill., has obtained a tie-in with the famous "Queen for a Day" radio program, starting May 10 and continuing through the months of June and July. This program is broadcast over the Mutual Broadcasting System of approximately 500 stations with a listening audience estimated at 5 million. The feature of each week's program furnished by the Ice Cooling Appliance Corp., will be the giving away of a Vitalaire air conditioned ice refrigerator, Model VJ-61.

Ice distributors in cities which have a Mutual outlet are arranging for a spot announcement to follow this broadcast to the effect that the Vitalaire air conditioned ice refrigerator given to the "Queen for a Day" may be seen and purchased at their plant or appliance store.

Wisconsin Ice & Coal Co. Observes 100th Anniversary

THE Wisconsin Ice & Coal Co., one of the oldest ice distributing concerns in the country, is observing its 100th anniversary this year, having been founded in 1849 by John Theodore Kopmeier. Mr. Kopmeier came to this country from Germany in 1839 and after a brief stay in Cincinnati, moved to Milwaukee where he continued to live.

He originally started in the milk distributing business but soon learned that the ice he used to protect the milk was in greater demand than the milk itself. He began selling ice to keep the milk fresh and in a short time the milk end of the business was dropped entirely and attention was devoted exclusively to ice and the first step toward the present big organization was definitely taken. Mr. Kopmeier was joined in the business by the two older sons, John and Gerhard, and was active until the oldest son, John, took over the management in 1878.

The business is now being conducted by the fourth generation of Kopmeiers. Norman J. Kopmeier, grandson of the founder, is president, and Waldemar S. Kopmeier, also a grandson of the founder, is secretary-treasurer. John Henry Kopmeier II, Waldemar's son, joined the company in 1930 thus bringing the fourth generation into the original business.

Indiana Grocers Convention

THE Indiana Retail Grocers and Meat Dealers Association held its annual convention at the Claypool Hotel in Indianapolis, April 24 and 25. For the third consecutive year the Indiana Ice Industry was represented by a very attractive exhibit of the iced vegetable cases at the meeting. Through the courtesy of Al Trusty, Laporte, Ind., two cases were shown, a three foot poultry case and a six foot vegetable case, attractively dressed with fresh produce in crushed ice. Much interest in the exhibit was shown by those present and several good sales prospects were obtained.

American Ice Co. to Continue Expansion

THE American Ice Co. will continue to expand its business in the areas in which it operates as opportunities are presented, stockholders were told at the annual meeting. Last year the company acquired ice plant properties involving an expenditure of approximately $625,000. Part of this acquisition, Charles C. Small, chairman, stated was made late in the season and made little difference in 1948 operations. A move by two stockholder groups to place two members on the board was defeated. The seven directors were re-elected.

Ice Company Dismantles Plant

THE Pana Ice Co. which has served Pana, Ill., since the early 1900's, will not be manufacturing ice this summer according to a news item. The ice manufacturing plant has been dismantled. The community will still be served by the Pana Ice Co., which will purchase ice from Hillsboro and other nearby cities which have up-to-date plants. The owner of the Company, Ennis Pfau took this step because he decided that he could buy ice from other plants cheaper than he could manufacture it locally with the old and outmoded plant. Modern refrigeration equipment has been installed in the storage room of the old plant.

Stockholders Claim Mismanagement of Shreveport Ice Company

MISMANAGEMENT of the Louisiana Ice Co., Shreveport, La., and misuse of corporation funds by the firm's directors was charged recently in a suit filed in federal district court by two stockholders who ask that a receiver be appointed to operate the business. The two stockholders, Mrs. Marie Kinnebrew of Gregg county, Tex., and Mrs. Flora Belle Patee of Sebastian county, Ark., ask that a receiver be appointed to take over operation of the ice company for the purpose of conserving its assets and administering its affairs.

The board of directors of the ice company is composed of S. R. Morgan, Jr., Charles E. Elkins and W. E. Morgan. S. R. Morgan, Sr., claims to have resigned as a director in 1948.

The suit alleges that Morgan and his wife, Mrs. Maude Morgan, and W. E. Morgan and S. R. Morgan, Jr., "have been operating the Louisiana Ice Company as though it were their individual property and have consistently conducted its affairs in conjunction with other ice manufacturing establishments owned by the Morgan family, all to the loss and detriment of the stockholders of the Louisiana Ice Co."

As stated in the March issue of ICE AND REFRIGERATION a suit involving similar charges was filed against the company last fall by Claud Kinnebrew and Mrs. Irene K. White, two of the company's stockholders, and this suit was dismissed, the court holding that there was no evidence of mismanagement.

American Ice Asks Stock Tenders

THE American Ice Co. of New York City is asking its stockholders for tenders of common stock not exceeding 28,800 shares within a period of 30 days expiring June 9. The company will accept tenders in the order of the lowest prices offered, but not in excess of $9 a share. If more than 23,800 shares are offered, the company may in its discretion purchase all or any part of the excess.

The tenders are asked in connection with a plan, when market conditions warrant, for the exchange of common stock, or common stock and cash, for the outstanding 17,747 shares of $6 non-cumulative non-redeemable preferred stock. The preferred stock that is acquired would be retired.

On May 5 the company acquired from Continental Illinois National Bank & Trust Co., trustee under the last will and testament of Thomas M. Howell, deceased, a block of 76,200 shares of American Ice common stock at $9 a share. It expected to acquire at least 100,000 shares, but one estate beneficiary, to whom distribution of 38,100 shares had been made, was unwilling to sell at this price.

California Ice and Fuel Sales Show Increase over Last Year

TAXABLE sales of ice and fuel in California during 1948 increased 10.18 per cent over the preceding year to reach a total dollar volume of $58,821,160, according to figures made available by William G. Bonelli, chairman of the California State Board of Equalization.

This volume of sales produced state sales tax revenue totaling $1,470,529. California's sales tax was levied during the year at the rate of 2½ per cent, but legislation is currently pending to restore the rate to its 3 per cent level of former years.

Ice Plant Establishes Open Air Ice Skating Rink to Use Surplus Refrigerating Capacity

A NEW $100,000 ice skating rink, the first of its kind in the central Rocky Mountain area recently was finished at Salt Lake City, Utah by the Hygeia Ice Co. Scheduled to be an open air rink for the first year or two of operation, its dimensions are 85 by 200 ft. Some 15 miles of Byers wrought iron one-inch piping on three inch centers provide the freezing surface. The pipe runs lengthwise of the rink, contrary to custom. The only insulation is washed sand laid over bare earth.

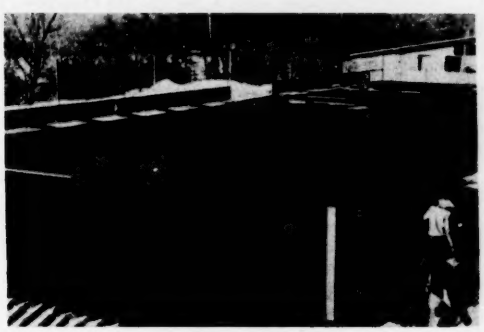

Fig. 1—View of a portion of the 15 miles of 1 in. brine pipe laid to refrigerate the ice rink surface.

The spray method of freezing is employed, providing an ice thickness of about one and one-half inches above the pipes. Surface finishing is accomplished by use of planing and hot water brushing.

A 33 by 80 foot warming house and lounge is located a few feet off the rink's street side. It houses skate renting facilities, lockers, a snack bar and rest rooms. A grandstand is to be added later with a capacity that will accommodate 5000 persons.

Elaborate plans have been made for promotion of ice sports, according to J. Roy Free, Hygeia president. Hockey leagues are being formed and figure skating meets are planned. Skating instruction will be offered. All skating will be controlled and supervised to provide each type of skater the particular kind of skating he desires at the time most convenient for him.

The decision to build stemmed from two central reasons. First, the lack of artificial skating rinks in the area and the favorable Utah weather for natural ice had created a long felt want for a good artificial rink, promising a reliable trade expectancy. Second, the drop in commercial ice demand during the four to six coldest months left a sizable surplus of brine refrigeration in the main plant adjoining. This surplus, with very little added cost, can be piped to the rink to supply adequate freezing. The rink will be operated about 8 months of the year.

Hygeia is a pioneer in the ice and refrigeration business in Salt Lake. It produces all types of commercial ice, supplies storage lockers and engages in meat and produce processing.

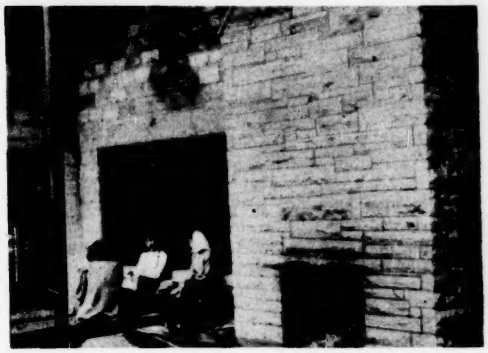

Fig. 2—Interior of the service building for the skaters.

Northwest Ice Industry Proclaims Cocktail Mixing Champion

A publicity stunt for the ice industry, a cocktail mixing contest for the Northwest champion was staged in Seattle, Wash., sponsored by the ice industry of Seattle and Tacoma. The contest was conducted by Willard Ferrier who put on a national "handsomest ice man" contest for National Ice advertising in 1940.

More than a score of entrants were entered and the event drew a large crowd from the ice, beverage and liquor industry. The judges were Earl Swanberg, Diamond Ice Co., Edward Himmelman, manager of the Benjamin Franklin Hotel and Mr. Ferrier. The event received a lot of local publicity including two specially written feature articles by Doug. Welch of the Post Intelligencer and Byron Fish of The Seattle Times. It was the biggest publicity stunt for the ice industry ever seen in Seattle.

The drinks turned out were reported to be a "sight to behold" and the winners were Conn Elhardt who won the Jos. Martocello Trophy for the best cocktail using whiskey; Ted Fleck for the best cocktail containing gin and Ed. Skorka for the best cocktail using brandy.

In an entirely different event the ice industry and Pan-American World Airways sponsored a match meltage race between 100 lbs. of million year old ice from the Mendenhall Glacier in Alaska, and a piece of ice man's ice weighing a like amount. The glacier ice won in 65 hours 3 min. to the ice man's ice time of 56 hours 23 min.

Royal Palm Buys Florida Ice Company

SALE of the Fort Pierce, Fla. Ice and Cold Storage, Inc. to the Royal Palm Ice Co. interests of Miami, has been announced by Lee Benoist, president of the Fort Pierce company, and N. C. Mc Connell, vice-president and general manager of the Miami company. The consideration was understood to have been approximately $260,000. The new owners, who own several plants in the Miami area and elsewhere, have already taken charge. The Fort Pierce company is a pioneer establishment, formerly known as St. Lucie Ice Co. Mr. Benoist acquired it in 1932.

A new ice plant, to cost about $250,000, will be established in Fort Pierce by another Miami Ice Company, the Pure Ice Manufacturing Co. The new plant will be located at 2nd St. and Avenue G on the riverfront. I. Krumen is head of the new company.

Reports From Unit Ice Associations

California Association of Ice Industries, Annual Meeting

THE 29th annual meeting of the California Association of Ice Industries was held at the Biltmore Hotel, Los Angeles, Calif., March 21-23, 1949. Both the southern and northern divisions were well represented and in addition a considerable number of Texas ice men were present. The program was interesting throughout. In the exhibit rooms of the hotel modern products and appliances used in the production and distribution of ice were displayed.

The convention opened Monday afternoon under the direction of President Arthur M. Stoker with the usual address of welcome by the Hon. Fletcher Bowron, mayor of San Francisco.

Harold G. Hacke of the Union Ice Co. of San Francisco and Divisional Chairman of the 1949 advertising campaign gave a report on the National Public Relations program. Mr. Hacke's talk was supplemented with a film showing the details of the program. Commenting on the finances, he said that the size and effectiveness of the campaign will depend very largely upon the amount of money subscribed.

Mount Taylor, executive secretary of the National Association of Ice Industries called attention to some of the more important conditions in the ice industry, "Along the 1949 Business Highway." For about seven or eight years, he said, the ice industry has been going along with little or no competition and many ice distributors were peacefully inactive during that period, but now they are coming to the time when they will all need to build better public relations, improve the efficiency of their operations and really sell ice-using equipment.

The ice industry in common with other industries is now faced with a lot of problems. To move ahead and hold their own in this competitive business situation, he said, ice distributors must develop new ideas, new methods, new economies, new techniques and new confidence in the future of ice. It is a basic fact that the ice industry needs more sales and better operating techniques, and it needs to bring into its organization a continuous flow of the influence of youth, of young men of vision, initiative, courage and resourcefulness. Mr. Taylor also discussed the pending Wage-Hour bill now in Congress and other legislative developments.

Safety Training

An interesting panel discussion on safety training and controls was conducted by Ken Sartori, San Francisco; R. J. Hoenig, Los Angeles; Louis E. Smith, San Francisco, and Clem Worman, San Francisco.

On the subject of plant safety, Mr. Smith said the accident records of his company showed that some 50 per cent or more were caused from the handling of ice. When an accident occurs they try to find out exactly what caused it and what they can do to eliminate such accidents. Their accident training is on a personalized basis with pictures taken in the plants and these are shown with a running comment on safety pointers.

The subject of truck safety was discussed by Mr. Worman. In addition to showing a safety film, they had found that definite safety instructions were needed. Truck accidents, he said, are very difficult to pin down and for this reason, specialized and personalized training was found necessary. The right kind of men have to be selected and trained and if any faults show up, they are corrected immediately.

Officers for 1949-50

President, Arthur M. Stoker, San Francisco

Vice-presidents. W. F. Asbury, Phoenix, Ariz.; V. V. Ogburn, San Francisco; M. W. Young, San Francisco.

Treasurer, R. J. Bailey, San Francisco

Executive-Manager, Leon A. Bailey, San Francisco

General over-all safety was discussed by Mr. Hoenig. His company has two central safety committees, one for the north and one for the south divisions. These committees plan and direct a safety program for the entire company and make a thorough study and analysis of all accidents. They act as a clearing house for safety materials and for means to stimulate constant interest in safety measures. These committees are made up of heads of departments such as plant, delivery and appliance sales office. In addition to this main committee, there are safety committees at each branch which meets every two weeks to discuss safety problems of their particular branch.

Icing Demonstration

A dramatic skit on ice sales written and produced by R. W. Davis, depicting the "Boomerville Ice Co.," its sales difficulties and other problems was put on by the Geller Theater Workshop of Los Angeles.

This was followed by an interesting demonstration on vegetable icing with Mr. Davis taking the part of Mr. Vishinski, a grocer, and H. C. Epperson as an ice salesman. Discussing his part in the demonstration, Mr. Epperson pointed out that in talking to a customer, the salesmen cannot deal in general platitudes; he mustn't tell the customer that ice will keep his produce because he doesn't want to keep it, he wants to sell it; and regarding the point that it will save him money, there are thousands of salesmen telling him that all of the time. The salesmen's best bet is to have actual visual demonstrations which prove that the statements he made are supported by cold facts. In the demonstration which followed, Mr. Epperson called on Mr. Vishinski, the grocer, to whom he pointed out the benefits of crushed ice for preserving vegetables.

Automatic Ice Cube Machines

A panel discussion on automatic icing cube machines was conducted by J. C. Rear, San Francisco; Arthur M. Stoker, San Francisco; Albert Lydick, Los Angeles and A. E. Hart, Los Angeles. Introducing this panel, Glenn W. Gurtner presiding at the session said that the industry should take the position that while these machines make very rugged competition, it can be met successfully provided ice men really tackle the problem.

Mr. Hart said that ice cubes made of real ice is a quality product and the ice company furnishes a service to meet the demands of customers and has the willingness and the desire to get out and merchandise the product.

Mr. Stoker pointed out that in order to hold such business, it is necessary for the ice industry to not only furnish a good product and good service at the right prices, it must also meet competition which promises the saving of money.

Mr. Lydick said an investigation of the situation showed that the one big talking point of the ice industry is that their cubes are sanitary and can be delivered to the customer at his convenience and this fact should be kept constantly in front of all customers.

Training Drivers

J. D. Blackstone of the United Parcel Service gave an interesting talk on what his company is doing in the selection, training and supervising of their drivers. When employing a new driver, the initial interview will disclose whether he is acceptable from the standpoint of appearance, attitude, capabilities and sense of responsibilities. An application blank then will give other details such as his job history, education and personal references. If acceptable, he is then given a driving test and further training under the tutelage of an experienced driver.

Paul Kent of the Adohr Milk Farms discussed the same subject from the standpoint of training right salesmen. This is accomplished through lectures, films, and demonstrations.

H. G. Rogers of the Coca Cola Beverage Co. gave a talk on their methods of selecting, training and supervising personnel. They also place much stress on proper selection of new employees and this is followed by an intensive training program. Training, he said, is the passing on to the employee of the information which he must have to do a proper job.

Paul F. Andres, Southern Ice and Dairy Products, Oklahoma City, Okla., and chairman of the Personnel Training and Marketing Division of the National Association, reviewed the previous talks on personnel training and said they all applied directly to the ice business. He then discussed in some detail the work of the Personnel Training and Marketing Department of the National Ice Association in training employees in the ice industry including service manuals for employees and supervising personnel and training films.

The latest development along this line, he said, is the Ice Marketing Institute set up in Washington last October. Up until March 19, the date of the last graduating class, he said 116 men from all over the country spent two weeks taking this course which prepares them to do a perfect service and selling job. This course, he said, is especially valuable because it is bringing youth and youthful thinking into the ice industry. Another later development was the formation of ice merchandising councils under the auspices of the various unit associations and these will supplement and carry on the work inaugurated by the Ice Marketing Institute.

Ice for Preserving Foods

A panel discussion on the general subject, "The Ice Way is the Best Way" was conducted by R. W. Davis, San Francisco; Walter Sauber, Swift & Co.; J. H. Dunn, Shop-N-Time, and Walter Van De Camp, Lowrey's Prime Rib. These three members of the panel represented customers of the ice industry in food markets, restaurants, and poultry packers.

Representing the food markets, Mr. Dunn said at first he thought that use of ice for produce would be too expensive but after giving it a fair trial they had found that it pays because of increased sales, reduction in shrinkage and savings in labor.

Mr. Van De Camp, representing restaurants, said although they are not particularly important to the ice industry from the standpoint of volume, they do use ice for salads, cold drinks and many other uses. Some have a seafood bar in which shrimp, crab, oysters and other seafoods are displayed in a bed of crushed ice. The use of ice in connection with food, he said, greatly improves its appearance which is an important factor in restaurant operation.

Mr. Sauber of Swift & Co., said that from their experience ice provided the best refrigerating medium for packing poultry. It not only accomplishes the necessary chilling but it also eliminates the necessity of maintaining expensive coolers.

Texas Day

The final session held Wednesday morning was designated Texas Day in honor of a good sized delegation of Texas men present at the convention. The welcome addresses for this session were given by E. W. Biscailuz. Sheriff of Los Angeles County, and Tom E. Rogers of El Paso Tex., president of the Southwestern Ice Manufacturers Association.

J. C. Thompson of the Southland Corp., Dallas, Tex., pointed out that the present all-important subject in the ice industry today is merchandising of ice and appliances. In this connection, he said, the Ice Marketing Institute is doing an excellent piece of work and offered a means of putting and maintaining the ice industry in its proper position in the business world. He also emphasized the importance of the value of research and the good it will accomplish when its findings are put to work.

Jacob M. Irvine, Southern Properties, Inc., Dallas, Tex., discussed the engineer's conferences held by the Southwestern Association. At these conferences, which have become a regular part of the association's work, problems of production, maintenance, corrosion and other technical and production features are discussed. Their purpose is to keep the engineers refreshed on the fundamentals of refrigeration, and up-to-date on new developments in equipment and methods.

O. T. Clark, Riverside Ice Co., Fort Worth, Tex., gave a very interesting convention talk highlighting some of the problems of the ice industry, interspersed with humor and philosophic comments.

Closing Address by Weatherred

Gen. Preston A. Weatherred, executive secretary of the Southwestern Ice Manufacturers Association, an honored guest of the convention, delivered the closing address. Twenty-five years ago, he said, the major problem in the ice industry was that of production with scant thought to service and with none for the building of public or customer acceptance.

The year 1925, he said, marked the greatest consumption of ice up to that time and it was a year of unprecedented profit. But it was also in November of that year at the National Association convention that mechanical competition first became recognized as a potential competitive force. And it was at this convention that the issue between the men of little faith and the men of great faith of the ice industry came into being, the issue that has persisted to this day, and as the years went on, the shock of competition proved to be a spur to progress.

Gen. Weatherred then gave a sketch of the organized effort made by the Texas ice industry to bring about plans designed to give greater assurance that the ice market should be stable and that the profits should be sustained. Over a period of this quarter century, Texas ice men have learned to live and work together and through cooperative thought, effort, research and expression, they have, on the whole, arrived at an understanding of their markets, of the elements of service rendered by ice refrigeration and a surer comprehension of their place in the sun of American industry.

Indiana Association of Ice Industries Annual Convention

THE fifty-fourth annual convention of the Indiana Association of Ice Industries held at French Lick Springs, April 12 to 14, attracted a larger attendance than usual and an excellent business and social program provided information and pleasure for the members and visitors.

During the convention, several members spent some time enjoying the facilities of the French Lick golf course. Winners were A. C. Lemons, South Bend, first place; Charles Scheidler, Greensburg, second place; S. R. Stephens, Richmond, Ky.; David Barnes, Gary, Ind.

For the ladies, more of whom were present that at any previous convention, an accessory style show, and a bridge party were arranged for their entertainment.

At the "sizzle" dinner Tuesday evening, Elmer Wheeler, newspaper columnist, was well received and the floor show following the annual banquet Wednesday evening was said by many to have been the best they had ever seen.

The usual exhibits of ice appliances and equipment were shown, and all exhibitors reported satisfactory results.

Speakers on the business program included Mount Taylor who delivered one of his always fine addresses and Dan Prager who gave a splendid talk on the activities of the Personnel Training and Marketing Department of the National Association and of which he is director. Eric Oesterle, Assistant in Agricultural Economics, Purdue University, gave a most interesting report on the research work done recently at Purdue which will soon be made available to all Indiana members. Earl P. Tregilus, staff member of Indiana University Department of Distributive Education explained facilities for employee training available to the ice industry through his department and others.

A demonstration of vegetable icing was given by Frank La Barbera of Greensburg and this was followed by talks on the same subject by B. H. Landing of Gary and Don Rose, Evansville.

Officers

New officers to serve during the coming year were elected as follows:

President, David C. Copeland, Richmond, Ky.
First Vice-president, C. D. Knight, Jeffersonville, Ky.
Second Vice-president, Ray Crosier, Connersville, Ind.
Treasurer, Henry L. Dithmer, Indianapolis, Ind.
Executive Secretary, O. P. Fauchier, Indianapolis, Ind.

Missouri Ice Sectional Meeting

ICE PLANT owners, sales managers and public relations men, members of the Missouri Ice Manufacturers Association, held their quarterly meeting and luncheon at the Old Missouri Homestead at Sedalia, Mo., recently. Over forty ice companies from Missouri were represented, as well as a few in attendance from out of the state.

During the day's meeting, a forum where everyone entered into the discussion, was held for the purpose of promoting the merchandising of ice appliances and the use of ice for beverages and vegetables. Movies illustrating how to increase sale of ice and its appliances, and the use of ice by grocery stores for fresh vegetables were shown.

J. R. Dean, Cape Girardeau, president of the Missouri Ice Manufacturers Association, presided at the meeting. Charles Hood of Independence as chairman of the forum, V. A. Esphorst of St. Louis, secretary, and C. W. Avis of St. Louis, were in charge of the meeting.

Ohio Merchandising Conference

A SALES and merchandising conference was held at Columbus, Ohio, Monday and Tuesday, March 18 and 19, by the Ohio Association of Ice Industries. It was a most interesting conference attended by approximately 50 members of the association or their representatives.

One of the important parts of the program was a panel discussion held Tuesday morning on merchandising topics previously covered by speakers and discussion leaders. Moderator was Guy W. Jacobs and members of the panel were Dan Prager, Andy Andrich, George Warren, Dick Fischer, A. B. Griffee and David Copeland. Nearly everyone present participated in the discussion and all phases of merchandising ice and ice appliances were covered either by members of the panel or by those in the audience.

The conference started Monday noon with a complimentary luncheon by the association. The meeting was formally opened with an introductory talk by William A. Neher, chairman of the Merchandising Committee, who explained its purpose and outlined the program.

Dan Prager, director of the Personnel Training and Marketing Department, National Ice Association, outlined the essential elements of employee selection, job description, employee training and employee regulations.

The subject of how to develop vegetable icing in the retail store and market was well covered by Dick Fischer, sales manager of the Serv-Ice Delivery Co., Akron, and this was followed by a practical demonstration of the subject by Andy Andrich, field service director of the National Ice Association.

An interesting and informative talk on merchandising in the ice industry was given by David J. Copeland, Richmond, Ky.

A showing of the National Ice Film, "Naturally Yours," a talk on selling domestic refrigerators by A. B. Griffee, South Bend, Ind., and merchandising for the ice industry by George Warren provided a well-rounded merchandising and sales program.

Those who attended the meeting expressed the opinion that they had greatly benefitted by participating in this conference and before adjourning they voted unanimously to hold future meetings of a similar nature. It was announced that another state-wide conference may be held in the fall and in the meantime the Merchandising Committee expects to have smaller group meetings held in various parts of the state.

The Ohio Merchandising Committee is made up of the following: W. A. Neher, chairman, Troy Ice & Coal Co., Troy; Dick Fischer, Serv-Ice Delivery Co., Akron; W. R. Cunningham, City Products Co., Columbus, and Charles Boardman III, Murray City Coal & Ice Co., Columbus.

Canadian Association of Ice Industries

By K. C. McCrea, Secretary

AT the annual Canadian ice convention held early in March, the British Columbia and other western members made a strong request that the dates of the 1950 convention be moved to the early part of November this year so that they might attend the Canadian convention and the National Association of Ice Industries convention in New York City on the one trip. At a meeting of directors held in Toronto on Monday, April 11, Niagara Falls was selected as the place of our next convention and the dates were set for November 9 and 10.

At the same time our Fall ice plant conference which had been scheduled for Monday, April 24, was postponed to Tuesday, November 8. This means that we will have a plant conference and annual convention of three days.

The Practical Refrigerating Engineer

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OPERATING • MAINTENANCE • NEWS
QUESTIONS AND ANSWERS

National Association Practical Refrigerating Engineers

PRESIDENT
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Tulsa, Okla.

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The Automatic, Internal Liquid Recirculating System

By J. E. Watkins
Midwest Engineering & Equipment Co., Chicago

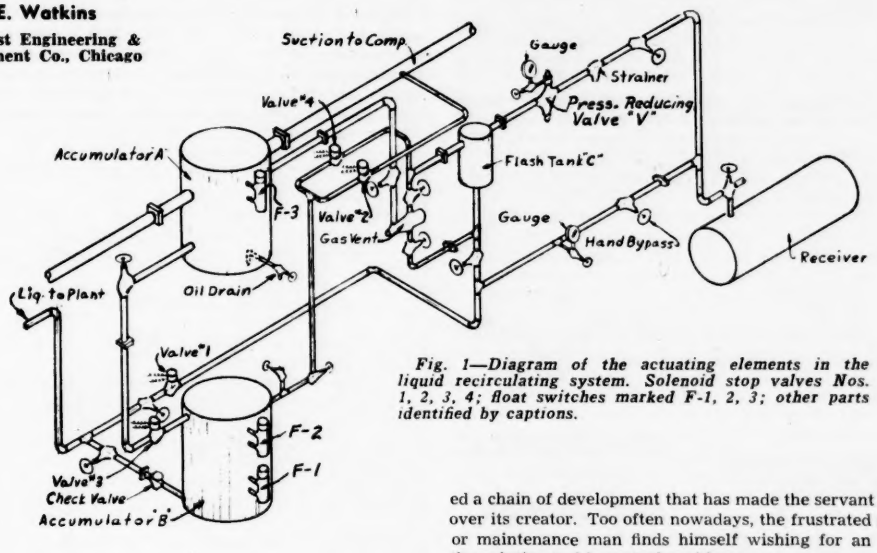


Fig. 1—Diagram of the actuating elements in the liquid recirculating system. Solenoid stop valves Nos. 1, 2, 3, 4; float switches marked F-1, 2, 3; other parts identified by captions.

AS IN many other industrial fields, the development of automatic controls for refrigeration has now reached the point where controls are being installed to insure the performance of other controls. One is often reminded of the Army specification for a freezer during the last war which called for a small piece of 2 x 4 to be hung inside the freezer alongside a placard directing anyone unfortunate enough to be locked in to use the 2 x 4 to break a small window in the wall of the freezer in order to reach an axe hung outside the window. The placard was so explicit it left no doubt that the axe was to be used to cut an exit through the door.

When George Hilger first replaced a hand expansion valve with what is now called a thermostatic expansion valve, he felt content in the knowledge that he had improved matters by creating a useful servant. But he started a chain of development that has made the servant master over its creator. Too often nowadays, the frustrated service or maintenance man finds himself wishing for an axe as the solution to his control problems.

In order to flood our evaporators with anything approaching efficiency, we have had to guard against liquid slop-

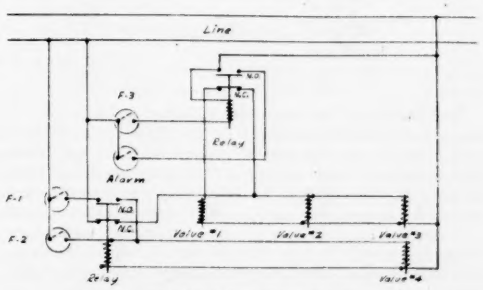


Fig. 2—Wiring diagram of the system.

Presented to the 39th National Convention, NAPRE.

overs to the compressor. This has led to the use of suction line accumulators and liquid pumps to return the excess liquid to the receiver or some other safe part of the system. The additional power, maintenance and replacement costs have hardly been justified by the gain in evaporating efficiency. It is not surprising that occasionally operators return to the old hand expansion method of liquid feed, even though they may be increasing thereby the superheat in the suction gas, lowering suction pressures and generally adding to their operating costs.

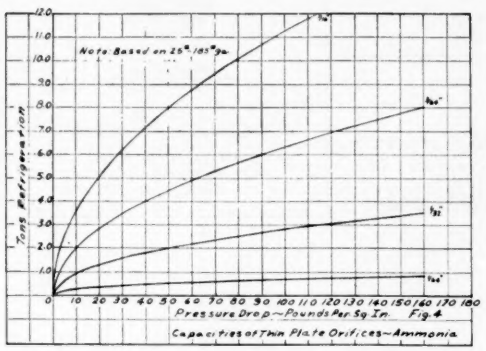

Note: Based on 25° 185° psi
Tons Refrigeration
Pressure Drop—Pounds Per Sq. In.
Fig. 4
Capacities of Thin Plate Orifices—Ammonia

Fig. 3—Capacities of thin plate orifices in tons refrigeration at various pressure drops—ammonia refrigerant.

Internal Pump

Figure 1 is an isometric illustrating the heart of the system, the internal pump. Accumulator **A** is a conventional trap in the main suction line. **B** is a secondary or collecting accumulator, which drains **A** through automatic valve **3** and is vented through automatic valve **2** to the suction (or to the accumulator). **C** is a flash tank supplying liquid at low pressure to the main liquid line from a pressure reducing valve **V**, the liquid level in **C** being maintained by an automatic gas vent, with the flash gas vented to the suction line (or to the accumulator). The flash tank also supplies gas at the flash pressure to **B** through automatic valve **4** when called upon to do so. Both **B** and **C** are connected to the main liquid line to the plant, **B** through a check valve and **C** through automatic valve **1**. Float switches **F-1** and **F-2** on **B** operate to maintain liquid levels between their actuating levels. Float switch **F-3**, high up on **A**, is wired to operate an alarm bell or light and to close automatic valve **1** in case the liquid level in **A** reaches the necessary point due to any failure. Thus, the plant is allowed to pump down or be manually operated while repairs are made. In place of the gas vent, another float switch and solenoid may be substituted, and in cases where the height between **A** and **B** is sufficient a check valve may be used in place of valve **3.**

Figure 2 is a wiring diagram of the system. It will be noted that as the level in **B** rises and **F-1** closes, nothing happens because the actuating relay is de-energized and in the position shown. However, as the liquid level rises further and **F-2** closes, the relay is energized and short circuited through **F-1**, remaining thus after **F-2** breaks with

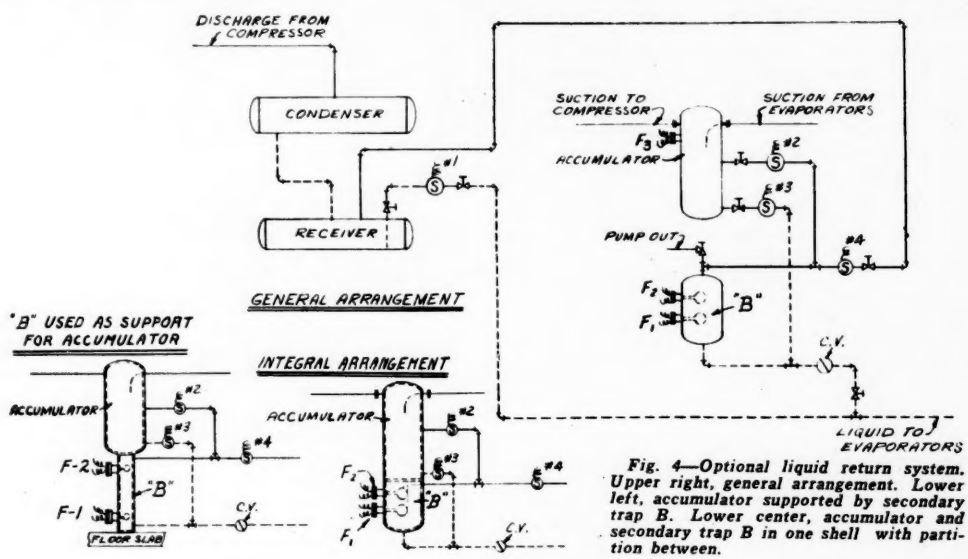


Fig. 4—Optional liquid return system. Upper right, general arrangement. Lower left, accumulator supported by secondary trap B. Lower center, accumulator and secondary trap B in one shell with partition between.

The automatic internal recirculating system owes its existence to the developments so sketchily outlined above. It is a return to an old starting point, plus the application of moderation in the use of a few relatively trouble-free controls and the elimination of moving parts. Advantages gained by the discarding of certain conventional controls will become obvious as we proceed with our description, which deals with ammonia. It should be stated, however, that the system will operate equally well with other refrigerants.

falling level and until **F-1** breaks, returning the circuit to the original position and completing the cycle.

As the level in **B** rises, the relay being de-energized, valves **1**, **2** and **3** are energized and opened through the normally closed contacts of the relay. Automatic valve **4** being closed at this point, liquid is allowed to drain through valve **3** from **A** to **B** while gas vents through valve **2.** Since **1** is open, liquid is fed from **C** to the system while the pressure in the liquid line holds the check valve closed. This is the normal, draining period.

As the level rises further in **B**, F-2 closes and energizes the relay, reversing the controls so that valves **1**, **2** and **3** are closed and **4** is open. Thus flash gas pressure is released through **4** to **B**, opening the check valve and forcing the liquid out of **B** into the main liquid line around closed automatic valve **1**. This condition holds until F-1 breaks, reversing the controls and placing the equipment again in normal, draining operation.

Feed Control Simplified Low Pressure is Adequate

It is obvious that the pressure in the liquid line to the plant is held constant at the flash gas pressure, insuring constant year-round low pressure feed to the evaporators or low side. The problem of feed control to individual evaporators is thus reduced to the design of fixed orifices or a rough adjustment of hand valves, with no regard for over feed or slop-overs. By the same token, since the flash gas, or actuating pressure, need be only a few pounds above the suction pressure, the condensing pressure can be allowed to drop to any point that the condensers and the weather choose to furnish. Conventional controls are designed for pressure drops averaging 125 to 140 lb., and are therefore starved for liquid whenever the condensing pressure is allowed to fall below the design requirements of their seat or orifice areas.

To evaluate this advantage, one need only realize that many plants are capable of delivering condensing pressures as low as 75 lb. gauge during considerable cold weather periods. Since such plants usually find it necessary to impose as much as 125 lb. condensing pressure in order to maintain liquid feed, and since a saving in bhp per ton of ½ per cent per pound reduction in condensing pressure is a very safe average for these low pressure ranges, savings approximating 25 per cent are available during the cold season. And this is due only to possible reductions in condensing pressure.

Other Power Saving

Other direct sources of power saving become apparent as one studies Figure 1. For example, at 25 lb. suction and 185 lb. condensing pressure, the flash gas at the conventional expansion valve or feed control approximates 0.17 lb. out of each pound of liquid fed to the coil or evaporator. Therefore, since the specific volumes are 7.0 for the gas and .0245 for the liquid, only a negligible percentage of the coil or evaporator is theoretically flooded *at its beginning*, a percentage which increases as the *amount* of feed increases, but which can never represent the average for the entire evaporator. The use of surge drums with float valves and, better yet, injectors, serves to step up the performance of the evaporators. But such an installation becomes necessary for *each evaporator* in order to approach the performance of the recirculating system. Even then, the flash gas must be returned through the suction line, resulting in pressure drops that are largely overcome in the recirculating system by the removal of most of the flash gas *at the compressor*.

It should be obvious that the rate of liquid feed to the system may be set at any reasonable or economical figure, since the recirculation is entirely apart from both the compressor and the receiver. The desirable rate is found, of course, at the point where the friction in the liquid line and evaporators just fails to overcome the advantages of heat transfer gained as a result of the increased circulation; for liquid line pressure drops will result in flash gas.

In discussing the matter of increased evaporator efficiency, we should note here that the liquid recirculation acts to clear oil from the evaporators and to prepare the way for its easy collection in accumulators **A** and **B**.

In practice, on systems up to 25 tons, **A** and **C** are part of the same vertical drum, with **A** above and separated from **C** by a welded baffle. **B** is a smaller drum welded to and under **C**. Thus the entire assembly is furnished as a packaged unit. For systems larger than 25 tons, **A** and **C** occupy similar positions, with **B** inside **C**. This latter arrangement provides sub-cooled liquid to the plant at all times, both during the draining and the pumping periods.

In practice, too, pressure reducing valve **V** is actuated by both the suction pressure and the tension of a spring, the sum of the two being the flash pressure. In this way the flash pressure is maintained constantly at a desired amount above the suction pressure, insuring constant rate of feed through the orifices regardless of suction pressure.

Capacities of Plate Orifices

Figure 3 is a chart illustrating the capacities of thin plate orifices at various pressure drops. It will be seen, for example, that a 1/16 in. orifice will deliver twice the amount of liquid required to furnish rated capacity to a 2.0 ton evaporator, at 10 lb. pressure drop through the orifice. Should it be necessary by reason of liquid line friction, static pressure at upper floors, etc., to increase this pressure drop to 20 lbs. the orifice will deliver 6.0 tons, or 3 times the liquid required by the evaporator at rated capacity. Even an increase to 60 lb. pressure drop will not place any too great a demand on the recirculating system since the additional liquid returning in the suction line will only increase the pumping frequency. The desirable pressure drop through the orifice is, of course, that at which all evaporators in the system are flooded to full efficiency.

Normal maintenance of the plant equipped with the recirculating system becomes a matter of watching the flashing of several pilot lights, one for each of the four automatic valves actuating the mechanism. With low voltage wiring between rooms or evaporators and pilot lights, the performance of the entire plant can be observed from one central point.

Incidentally, a part of the system outlined above is applicable in cases where it is desired only to trap liquid from the plant suction and dispose of it in a purely conventional manner. Here the flash tank, reducing valve and gas vent are eliminated and valve **4** (see Figure 1) is used to feed high pressure gas from the top of the receiver (preferably) or from the discharge line, to accumulator **B**. Thus, during the pumping cycle, liquid is forced out of **B** through the check valve and into the liquid line around closed valve **1**. This arrangement, which uses the conventional receiver pressure in the liquid line to the evaporators, is illustrated in several forms in Fig. 4. It will be seen that this arrangement permits the use of orifices or hand valves to deliver more liquid to the evaporators than they are capable of evaporating, thus providing all the advantages of the complete recirculating system with the exception of the advantages resulting from the flash apparatus.

Other Operating Factors

Although the internal recirculating system has been proved in operation since early 1948, with no part replacements or failures during that time, certain questions invariably arise whenever the system is explained. We deal with these in the order of their importance: (See Fig 1)

Since there will be condensing going on in **B** when flash gas is brought over from **C** to pump the liquid out of **B**, will not **C** fill up with liquid and thus cause the apparatus to fail?

Obviously this would be true if tank **C** were extremely small in relation to **B**. The fact is that really very little condensation takes place in **B** since the flash gas is not

bubbled through the liquid in **B** but is allowed to contact only the surface of the liquid column. When the flash tank **C** is opened to **B**, the pressure in **C** starts to fall due to the equalizing of pressures and due to the slight condensation. Pressure reducing valve **V** opens immediately and admits more ammonia to **C**, causing the liquid to rise in **C**. However, it must be remembered that the flash gas leaving valve **V** amounts to from 6 to 23 per cent of the weight of the liquid passing through **V** depending on condensing and flash pressures. Here the 6 per cent rate is based on a condensing pressure of 80 lb. gauge and a flash pressure of 40 lb. gauge; the 23 per cent rate results from a pressure drop from 185 lb. to 0 lb. gauge. Now, the 6 per cent rate *by weight* really amounts, per pound of ammonia fed through **V**, to .06 x 5.1 or .306 cubic feet of gas and .94 x .0249 or .0234 cubic feet of liquid; while the 23 per cent rate amounts to .23 x 17.8 or 4.1 cubic feet of gas and .77 x .0235 or .0181 cubic feet of liquid. Hence it becomes clear that tank **C**, if made the same size as **B**, will furnish sufficient gas for the operation of the system, especially since the operating level in **C** is attained by the evacuation of the liquid in **C** after each pumping.

Since the level in **A** builds up during the pumping operation, is it not possible to slop over to the compressor at such times?

It is apparent that the size of **A** as of the other shells, is based on the plant capacity, with ample allowance for suction line drainage. Besides, float switch **F-3** is provided to prevent slop-over, as previously explained. As with any other piece of equipment, a 10 ton recirculator cannot be expected to handle 1000 tons.

N.A.P.R.E. Question Box

NOTE: H. G. Venemann, Chairman of the Educational Committee, has agreed to answer through this column all questions asked by the members of the N.A.P.R.E. Please send your questions to him care of Purdue University, West Lafayette, Ind.

Cold Plate Solutions

Question No. 811: Please give me the formulas to use to make up eutectic solutions having a freezing temperature or melting point of approximately minus 10 and plus 20 F. If you have formulas for making eutectic solutions for other temperature characteristics I would appreciate these also. The latent heat per pound of solution would also be appreciated for each formula.—R.H.D.

ANSWER: I suppose you have in mind solutions involving a liquid solute such as glycerine and the glycols. A report on the use of glycerine and propylene glycol water mixtures for this purpose was published in November, 1948, issue of ICE AND REFRIGERATION, page 80. From the tables in this article we have taken the information given below. If we assume that a range of from —20 to 0 F. would be satisfactory in the first instance, then the refrigeration yield in Btu. would be as follows:

Glycerine solution %	40	45	50	55	60
Refrigeration, Btu. per lb.	40	36.1	24.7	14.6	12.6
Freezing point, °F	4.6	—1.8	—9.6	—18.9	
Propylene Glycol sol. %	30	35	40	45	50
Refrigeration, Btu. per lb.	27	29	24.7	19.1	17
Freezing point, °F	8.8	0	—7.1	—17	—25

It is apparent that the best yield is obtained in this range by the 40 per cent glycerine or the 35 per cent propylene glycol solution.

In the range from 0 to 20 F. the solutions giving the best yield are 25 per cent glycerine and 20 per cent propylene glycol as follows:

Glycerine solution, %	25	30	35	40
Refrigeration, Btu. per lb.	60.3	50.7	38.9	25.2
Freezing point, °F	19	15	10.4	4.6
Propylene glycol, sol., %	20	25	30	35
Refrigeration, Btu. per lb.	46.6	35.8	28	18.2
Freezing point, °F	19.6	14	8.8	0

—EMERSON BRANDT

Not Agreement But a Dispute

It was realized that Questions 812 and 813 go into an area where a difference of opinion has existed for some years as the questioner indicates. (The first blower coils were installed in cold storages more than 50 years ago.) Basically it appears that the questioner wished to know in 812 whether there is any present trend toward agreement. The way to find out was to send the question to a number of engineers representing both manufacturers and users. This was done, and the replies received have been rather specific. Certainly they show no present trend toward agreement so that portion of the question is answered specifically. Some of the answers were more extensive. Because of space limitations they are being held for publication in the July issue. Don't fail to read them, too, in order to obtain a well rounded view of current opinions.

Probably Question 813 is too general to receive a specific answer. It is assumed the questioner desired to have authoritative opinion on the vertical clearance between stored goods and ceiling required for satisfactory distribution of forced air through various distances of discharge. Variables readily apparent are ceiling beams, variations in the height of piled goods and spacing in the stacks. Perhaps these eliminate the possibility of a simple reply. At any rate none was given and one answer questions the practicability. See the additional discussion next month. Does anyone else have further comment?—H. G. Venemann.

Applying Freezer Refrigeration

Question No. 812: We are planning to construct storage facilities for meat, poultry, and other frozen foods at minus 10 F. The question has been raised as to the best method of refrigerating these storage rooms. It appears that some difference of opinion exists as to whether coils for gravity air circulation or sprayed surface unit coolers with blowers would be best. Has any recent research, investigation or general concensus developed an answer to this question?—J.K.W.

ANSWER No. 1: We have heard recently that some packers are objecting to the storage of their meat products in freezers refrigerated with cooling units and apparently their objection is based on the higher circulation of air with these units than in the conventional freezer with coils.

We are of the opinion that where units are used a system of ducts should be installed to get a uniform distribution of air with a minimum velocity of the return air through the products.

There is considerable air movement in rooms with coils and we know from experience that it has a drying effect on unwrapped meat the same as air circulated through unit coolers.

Drying effect of air in freezers depends on its relative humidity as well as movement and we advocate extra large surface in unit coolers or pipe coils to keep the spread between temperature of refrigerant and air in the room as narrow as possible, preferably not more than 10 deg. F.—L. L. McCOY.

ANSWER No. 2 The refrigeration of storage rooms at low temperature has, during recent years, undergone a consid-

erable change of thinking. Originally gravity coils only were used. They were constructed of bare pipe and required defrosting occasionally. The defrosting was accomplished by pumping hot gas into the pipes and then breaking the ice off or simply by chipping the ice off without the use of hot gas. Next came the use of brine sprays over banks of bare pipes. The purpose of the brine sprays was to keep the coils clear of frost but in order to do this it was necessary to continually add salt to the brine or to use a complicated regenerator to keep its strength up.

The development of water defrost made it possible to use blower coils having a large amount of finned surface and to operate them dry except for periodically defrosting. Usually defrosting is done once per day or in some instances at much longer intervals. With normal temperature tap water it takes only a few minutes. Water defrost coils are now being used in all sizes of low temperature storage rooms from the smallest to the largest in existence.

Due to the low cost of water defrost ceiling units, it is possible to install considerably more surface and thus operate the job at a close difference between the temperature of the air and the temperature of the refrigerant. This not only increases the efficiency of the installation but also decreases shrinkage of the product where unwrapped product is being stored. The largest refrigerated warehouse in the world now nearing completion in Dallas, Texas, uses ceiling type water defrost blower coils.—D. D. WILE.

ANSWER No. 3: No doubt we are both agreed that forced air circulation (irrespective of presumed velocity or distribution) in storage rooms for holding meat, poultry or other foods at minus 10 deg. F. is basically wrong; regardless of the methods applied in distributing the required refrigerating effect. It appears to me that the wording of this question implies that the party already plans using the proposed storage facilities for the additional purpose of some freezing from time to time. Under the conditions accompanying this method of operation, I believe you will agree that the amount of "live load" received, the variable time intervals, kind of commodity, receiving-temperature, handling facilities, etc., are some of the data required before it is possible for anyone to suggest an economical or even a suitable means of removing the still questionable heat load; without any consideration of these seemingly minor factors: heat transfer with respect to the prevailing climatical conditions and the numerous other variable heat transferring factors affecting the adjacent external surfaces of such a proposed structure which could and often do alter recommendations, without regard to the proposed arrangement of pack or method of storage. This kind of thing also prompts me to write a book, but I feel my shortcomings in that it would be too voluminous to fulfill its need.—W. J. FINNEGAN.

Duct Distribution of Air

Question No. 813: Where blower actuated refrigerating units are used in freezer storage room, can you tell me under what conditions it is best to use ducts for distributing the air and when ducts are not required for proper distribution of the refrigerated air?—J.K.W.

ANSWER No. 1: With the development of convenient ceiling type blower coils, the use of duct work has become unnecessary for almost all installations. These units can be located where they will blow the air in a desired direction without the use of ducts and yet obtain ideal air circulation and temperature distribution. The elimination of duct work greatly reduces the amount of fan horse power required and generally ceiling units installed without duct work save a great deal of cost both for the equipment and the installation.

It is interesting to note that the large refrigerated warehouse, mentioned the preceding answer, uses ceiling type water defrost blower coils without duct work. The saving in fan horsepower made a substantial saving in compressor capacity in addition to the other savings.—D. D. WILE.

ANSWER No. 2: This question, like the other, reminds me of an interrogation presented a few years ago by my son, who was then four years old, that I haven't yet answered either to his or my satisfaction: "Daddy, does the earth rotate around the sun or does the sun rotate around the earth?" Of course, after some hesitancy, I replied, "It would be better if you refer to Einstein in that connection because I understand it is 'merely the way you view it'."—W. J. FINNEGAN.

New Questions

Oil in Refrigerating Coils

Question No. 814: Quite a number of cold storage plants are troubled with oil collecting in their evaporator coils. It not only reduces coil efficiency but also affects the operation of equipment such as float and thermal valves. Sometimes this oil is difficult to remove. Would kerosene be practical as a solvent to feed in while the system is in operation and thin the oil for easier removal?—W.N.T.

Booster Capacity

Question No. 815: How would you calculate the displacement of a booster compressor that would have a refrigerating capacity of 75 tons when operated at each of the three suction pressures:

0 lb. gauge 5 in. vacuum 10 in. vacuum

The booster discharge pressure would be maintained at 25 psi. while the second stage discharge would be 175 psi.—W.N.T.

Wet Gas Suction

Question No. 816: We are troubled with liquid coming back to our compressors under certain conditions. Our plant, equipped with two 7½ x 7½ compressors, contains a 5-ton ice tank, two freezer and five cooler storage rooms. All of the rooms have solenoid valves in the liquid lines. The freezer rooms have thermal expansion valves and we have no trouble with them. The cooler rooms have flooded float control evaporators. There are solenoid valves in the suction lines from all rooms except the meat cooler and the ice cream storage. The latter as mentioned, gives no trouble. The coolers are operated at 35, 37, 43 and 48 F.—all on 5 degree range.

Our trouble is that when the solenoid valves open on any one of these evaporators we get a wet gas to the compressor for a few minutes. We have renewed the float valve pins and seats but the liquid refrigerant continues to come over in the suction as described. What can we do to prevent this liquid return to the compressors?—H.V.S.

Member Activities

San Francisco

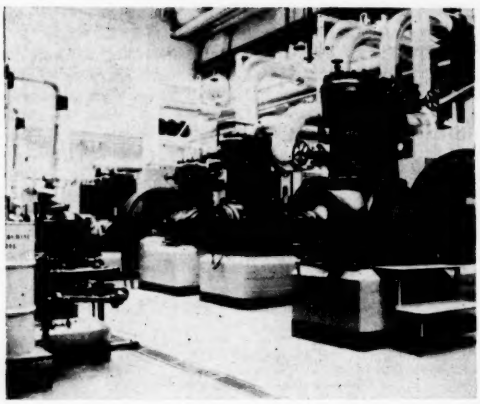
BY ANDY HOPE

ON April 27, about 125 members and guests accepted the invitation of Chief Engineer John Herzog of the San Francisco Brewing Corp. to visit the recently enlarged plant of the Burgermeister Brewery.

We were shown an engine room containing compressors that furnish more than 300 tons of refrigeration (soon to be increased by 250 tons), a 250 kw Diesel stand-by power plant (a memory of the acute power shortage last year) and 800 horse-power of Sterling boilers (to be increased within a year by 600 h.p.).

We were then taken to the brew house where new stainless steel kettles process about 3,000 barrels of beer per day (about 60 per cent more next year). One feature indicative of the modern trend is the remote temperature indicating and control panel which, by means of air pilot valves, controls the main steam valves to the kettles.

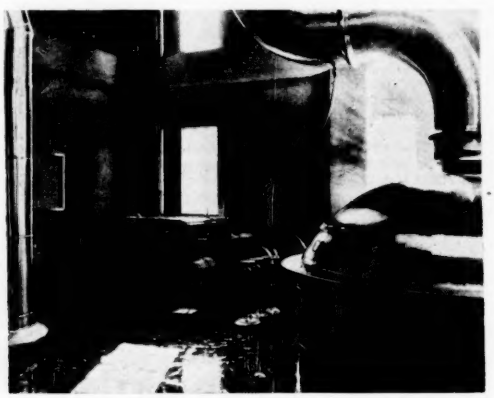
In the stock house where the beer is aged, Mr. Herzog says he will soon install controls so that the temperature of the cellars can be determined and controlled from the log desk in the engine room.



The very attractive and well equipped engine room of the Burgermeister Brewery. For safety and convenience in maintenance or alterations an overhead crane is provided.

The next stop was the bottle house which over an area of several floors houses five lines (soon to be six) consisting of bottle washers, fillers, cappers, pasteurizers and labelers handling a daily average of 8700 tall export bottles, and 7500 12 oz. white bottles at a rate of 228 per minute, 4000 32 oz. steinies at 110 per minute and about 6900 12 oz. cans at a rate of 200 per minute.

In the warehouse we saw how approximately 30,000 cases are brought in and about 27,000 cases shipped out per day to partially satisfy the demand for Burgermeister Beer throughout the length and breadth of the State of California.



One of the brew kettles is shown at the right. The large disposal unit at the left is used to pulverize the residue and flush it into the sewer system.

We were escorted to the silver room where, after seeing the many excellent examples of John Herzog's ability as an engineer to cope with the manifold problems that confront him in the course of his work, we were privileged to witness his extraordinary ability as a host in the providing of a super buffet supper with plenty of Burgie to whet the appetite and quench the thirst.

As we left the plant, the Carillon (which can be heard for five miles) on the topmost tower chimed out the familiar Burgermeister Chant (to the tune of Clementine) to signal the closing of a special treat for the members and guests of California Chapter No. 1.

Memphis

By Charles Conley

We enjoyed a visit by Dean W. R. Woolrich of the College of Engineering, University of Texas who was on his way home after serving a year as Senior Scientist with the Embassy of the United States in London, England. Dean Woolrich was accompanied by his son, Thomas and visited some of the important plants that have been erected in Memphis since he was here last. Members of Memphis Chapter in the group were, A. J. Clay, William Brooks, Cecil Sullivan and Charles Conley. All of them enjoyed the interesting account Dean Woolrich gave of his experiences in London and various parts of England to which his work took him. He agreed to arrange in the near future to meet with the chapter and give a talk on his observations and activities during the year overseas.

At the first meeting of the month, Herbert Phelps, Frick Co., Memphis talked on low temperature applications. He described and explained several quick freezing plants he had designed and installed in this section of the country. A number of slide illustrations were used and Mr. Phelps described the products and services provided by the plants. Other material covered some of the low temperature plants Frick Co. designed and built during the war for testing equipment.

The subject of air conditioning was presented by Harry Simpson at the second meeting. Applications he described were in several different kinds of structures, stores and office buildings. The importance of proper humidity control in air conditioning was stressed and Mr. Simpson said he found many plants which did not fulfill good housekeeping rules. He explained why good housekeeping is necessary to a well operated plant.

R. L. McDougal, assistant engineer of Clover Farm Dairy Co., was elected to membership. By vote of the chapter the educational meetings will be recessed during the months of June, July and August. The annual watermelon party will be held Wednesday, August 3.

Colton

By H. O. Bonter

The regular meeting of the chapter was held at the Santa Fe Ice Plant in San Bernardino, Calif., with a good group of members and guests in attendance. A sound motion picture from Owens-Corning Fiberglas Corp., entitled "Watts in Glass" was shown to the group. It was a very interesting picture showing the manufacturing of glass fiber 97 miles long from a small glass marble. The glass fibers are woven into thread, tubes, tapes and cloth. Other uses were described as in heat insulation and for insulating in electrical work. For the purpose of fire safety glass fiber cloth is employed for curtains and drapes. It was also pointed out that glass insulated motors will stand up better under higher heat, moisture and dust conditions.

The subject of E. H. Carlson's class lecture was freezing tanks. He demonstrated how to calculate freezing time, capacity and can ratios and the talk proved very interesting to those in attendance. After the meeting the group enjoyed the usual coffee, doughnuts, pie and cheese.

Rio Grande Valley

By Armin Doneis

The officers elected to serve the chapter during its second year are:

President, W. R. Woolrich, Jr.
Vice President, John Muller
Secretary-Treasurer, Armin Doneis
Sergeant-at-Arms, Dan Chapman
Director, J. L. Haley

Appreciative recognition was given to the 4 members who had a 100 percent attendance record during the past year; Russell Sawyer, C. G. Musch, A. M. Casberg and Armin Doneis. The importance of regular attendance at meetings was stressed to avoid needless repetition in the presentation of the refrigeration course.

The Educational Committee includes Sam Stracke, Chairman, A. M. Casberg and Don Blunt and Mr. Stracke will also serve as stand-by instructor.

It was proposed that Dean W. R. Woolrich, Sr., University of Texas be invited to address the chapter at a dinner meeting in the near future. There was a discussion of the

most desirable and practical educational program for the year with more stress on elementary refrigeration cycle and basic mathematics calculations. More gradual progress in theory seemed wise to allow less well prepared members to keep up with the group. It was emphasized that discussion and questions should be encouraged when points are not clear. Bashfulness and reluctance to ask questions or admit lack of understanding should be avoided. Initial lack of knowledge is no sin but continued lack is the student's own fault when the instructor continually asks "Is that clear," and receives no negative reply.

Use of more visual education films was urged. Possibilities of more outside speakers are to be examined. It was also proposed that the Educational Committee assign topics for discussion to each member on a subject in which he is more or less an authority so that he can discuss it before the group.

Portland

By Paul Paist

The April 1 meeting of the Portland Chapter was held in the plant of the Dairy Co-Operative Association and Mayflower Milk Co. of Portland. For this occasion a large number of members and their guests turned out. Before the tour started a brief description of the plant operations was given by Floyd Hewitt. personnel manager of the Dairy Co-Operative Association. The visit started in the cheese and butter department and progressed through the laboratory, bottled milk, ice cream, powdered milk and soft cheese departments. A side trip for the men took in the boiler and engine room, hardening and holding rooms, refrigerating plant and included a more technical and detailed description of the plant operation. At the conclusion of the trip refreshments were served in the Association's dining room.

Detroit

By L. L. Adams

A large number of members brought their families and friends to the Open House meeting on May 10 at Carl's Hall. The evening began with an excellent dinner. Then Harvey Wilson of the Greyhound Bus Co. presented a most interesting sound motion picture entitled "This Amazing America." This delightful travelog depicted many of the sights and experiences which travelers in America can enjoy. The evening was concluded with dancing.

Chicago

By E. B. Jones

The officers elected to serve the chapter during the year are:

President, Eugene Rytlewski
First Vice President, L. F. Clifford
Second Vice President, Ed Garnaas
Secretary, Jay Watson
Treasurer, A. O. Clementson
Sgt-at-Arms, B. R. Burns

Board of Directors: Charles Reid, Chairman, John Neff and L. M. Hinkey; Educational Committee, Don Parkhurst, Chairman; Membership Committee, George Hofmann, Chairman.

Preceding the meeting an excellent buffet supper was arranged by Eugene Rytlewski.

There was a general discussion of plant operation and problems. One matter that was stressed was the fact that so many refrigeration and air conditioning plants are crowded into inadequate space or placed in locations which are not accessible. In both cases proper operation and maintenance are always difficult and sometimes virtually impossible. It was pointed out that some air conditioning units, for example, are assembled with practically no space provided for inspection and maintenance. It was suggested that the industry take steps to inform architects regarding what space is needed for installation of a good plant and inform design engineers regarding designs which can be operated and maintained.

The president called on Emerson Brandt who told about the program being arranged for the convention at Purdue. He reminded the chapter that it was the one nearest to Purdue and would be able most conveniently to attend with moderate expenditure of time and money to benefit from the excellent program provided.

Since Chicago is the nearest chapter, A. R. Carlson suggested that committees of men and women be appointed to act as hosts at the convention. These committees could greet convention attendants, make them acquainted with each other and promote good fellowship. Further discussion was all favorable and it was the concensus that this program should be followed through.

The plant visit during the spring term was arranged at the Slotkowski Sausage Co. where the members inspected the refrigeration and other mechanical equipment. This well arranged and operated plant produces sausage and other meat specialties and has much excellent packing house equipment installed. Of special interest was a new compressor installation recently made and the latest design in controlled smokehouse facilities. This latter turns out a more uniform product with less shrinkage and handles the widening demand for specialties such as tenderized ham.

Following the trip through the plant the group enjoyed excellent food and refreshments by courtesy of the management.

Stockten-Modesto

By R. M. Edger

The special speaker at the regular meeting of the chapter was S. E. Petersen of the Ralph E. Manns Co., San Francisco who gave us a very instructive lecture on refrigerant charts and their use in plant engineering. Since Mr. Petersen has had considerable lecturing experience the presentation of his subject was excellent and all present received a great deal of knowledge from this meeting. Mr. Petersen also agreed to come over again and assist us in getting started on the same lessons San Francisco Chapter is using. We feel these will prove very interesting and attractive to our membership.

Los Angeles

By Fred Herr

A technical demonstration on "Direct Current Phenomena" which Regis Gubser, chief engineer of the California Consumers Corporation, presented in collaboration with several assistants from that company before Los Angeles Chapter several months ago, proved of such great interest that the cast was brought back by popular request on the night of the May 4 meeting.

The follow-up program dealt with "Alternating Current Phenomena." Equipped with an imposing array of equipment, Regis came through again with an absorbingly interesting demonstration which drew a large attendance. He supplied a running commentary as each demonstration was performed. The equipment, he explained, had in some instances been built on their own time by the men who were assisting him. These were Ralph Moore, assistant chief engineer of the company; Walter Perry, engineer of the Merchant's plant; William Osborn, safety engineer; and George Paulick of the general engineering staff.

The membership committee reported that 50 new members had been obtained in the 1949 drive, exclusive of three added at the May 4 meeting. Donald H. Byl of Union Ice Co. is high man, with 13 new ones to his credit.

H. H. Carlyle and Ray W. Bosher were initiated. Ed M. Stanley, a former member who resigned when he left the area several years ago, was reinstated. He is now affiliated with Sterling Motors Co., Los Angeles.

When he announced that 53 new members had been signed thus far this year, W. R. Burnett of the membership committee with an air of confidence patted a vacant spot on the wall between the two suspended pennants which the Chapter had won for membership supremacy in 1947 and 1948.

Phillip F. English, one of the chapter's charter members, was introduced to the group by President Rudi Kettler. Mr. English is now connected with Adohr Milk Farms.

A communication was received from Los Angeles City College asking whether, in the chapter's opinion, there would be sufficient interest and potential class enrollment available in Southern California to warrant the school authorities in establishing evening classes in refrigeration and air conditioning on the engineering level, including design and planning. Some members were of the opinion that such a course would merely duplicate one now offered at the Wiggins Trade School. Others contended that the proposed City College Course would be desirable, particularly if the curriculum carried the studies beyond the scope of the existing Wiggins School course.

At the previous meeting, the program consisted of 15 minute digests of outstanding refrigeration and engineering articles selected by four men named by Educational Committee Chairman Gubser. These were M. E. Bell of Eastside Brewery, Dale Rycraft of Peterson Mfg. Co., Frank R. Elliot of Union Ice Co. and George Paulick of California Consumers Corp. It was another one of Gubser's good ideas that held the interest of the members to such an extent that it will probably be repeated at some future meeting.

Pittsburgh

By Louis P. Mantz

The feature of the meeting was provided by two excellent motion pictures. Past President Leitholf introduced Kenneth Day of the Westinghouse Electric Corp., who presented the movies.

The first picture showed the manufacture of Westinghouse motors in their new plant at Buffalo, N. Y. We were amazed at the large number of motors being produced there and wondered where all of them could be used. The second movie showed the manufacture of large electrical locomotives, water turbines and generators. Then manufacture of radar equipment was depicted and finally the production of household electric appliances. A rising vote of thanks was given the lecturer and R. A. Roxas of the same company who handled projection.

Superintendent Day of the Grennan Co. plant was present to see his son Kenneth present the pictures. He extended an invitation to the members of the chapter and their friends to visit the Grennan plant on the condition that they bring their wives to the affair. President Sams lost no time in accepting the invitation. Several years ago Mr. Day was our host and everyone enjoyed the visit which it is expected will be repeated during August.

The chapter lost a good friend and member in the death of Charles V. Baker formerly chief engineer of the William Penn and Fort Pitt Hotels for about 40 years. Mr. Baker retired about 2 years ago and had been elected an honorary member of Pittsburgh Chapter.

St. Louis

By W. J. Wright

The meeting of St. Louis Chapter was held at the St. Louis School of Electricity and Refrigeration where our hosts had prepared for us a full course chicken dinner. Dinner was served in the school cafeteria and was enjoyed by all. The excellent hot rolls were most delicious and the chef presented each member with a sample to take home.

After a short business session the school's superintendent, Gus Wangerin, presented a most interesting talk as to the aims of the school and the important part played by vocational training in our overall educational programs. A trip was made through the school and attention was called to the various equipment used in the practical training of refrigeration men. After the inspection trip we were returned to the cafeteria where we were entertained with a full length sound movie. This proved to be a most entertaining mystery story.

The next meeting, at the invitation of Vice-president Clifford Renner was held at the plant of the St. Louis Dairy Co. He presented an interesting lecture on the functions of the modern dairy plant and a conducted tour of the plant followed. It had been understood that the St. Louis Dairy has one of the most modern plants in the country but full realization was the result of this trip. After the meeting the members and their guests enjoyed generous portions of ice cream, cake and coffee for which our thanks were extended to Mr. Renner and the dairy.

Harry H. Hawley

Harry H. Hawley of Fresno, Calif., died on April 11 at the age of 66 years. For more than 23 years, Mr. Hawley had been a member of the NAPRE and had served Fresno Chapter as both president and secretary. Surviving are his widow, Mrs. Olavee Hawley; a son, Harold S. Hawley; a married daughter, three sisters and two brothers.

No Graduation Until Fall

JUNE is the traditional month for graduation but for the chapters engaged in the 1949 Membership Contest, graduation will coincide with the end of the association year in October. The efforts of most chapters at this time have placed them in the freshman class where their further work will bring advancement. Others have already earned somewhat advanced positions as shown by the monthly summary.

Los Angeles with some 50 new members is progressing through the senior class. Although it is a little early in the year they are developing an air of confidence which is a challenge to their rivals elsewhere. Also in this advanced class is the Marion, Ill. group who continue to occupy top place on a percentage basis. They have a 75 point percentage at the present time.

Next in line are Detroit and St. Louis in the Junior class. Most of the chapters which have reached a good position have accomplished this by a combination of high percentage of renewals and new memberships. Early renewals are encouraged by giving a bonus. This bonus is equal to the percentage of renewals which when they reach 100 per cent will double the point value of new members. Contest winners usually base their good results on a high bonus as well as the addition of new members. The present line-up in the contest is shown in the list below. Chapters not shown in the list have not yet accomplished the minimum results.

Senior

Los Angeles — Marion

Junior

Detroit — St. Louis

Sophomore

Minnesota — San Jose — Chicago

Freshman

New Orleans	Dallas	Memphis
Pittsburgh	Fresno	Portland
San Francisco	San Jose	Seattle
Sacramento	Yakima	Colton
Rio Grande Valley		Stockton-Modesto

Theodore Huetteman

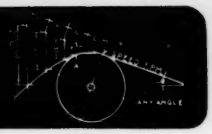
ON APRIL 20, Theodore Huetteman, Detroit passed away after an illness of some months. One of the founders and secretary of the Detroit Ice Machine Co. he was a charter member of Detroit Chapter, NAPRE. During 27 years he had been an active worker in the chapter, serving as president and in other offices. Since 1920 he had been a member of Rotary International and had been honored for an uninterrupted attendance record of 23 years.

Mr. Huetteman who was born in 1879, learned the refrigeration business thoroughly with the Huetteman and Cramer Co. of which his father was a founder. He worked his way up to superintendent of erection and handled many important installations all over the United States and Canada. In 1915 when operations of the firm were discontinued he joined in organizing the Detroit Ice Machine Co. and continued active in its operations from that time.

Survivors include his wife; daughter, Mrs. Thomas E. Lueck; son, Richard, and five grandchildren.

The National Association of Practical Refrigerating Engineers offers opportunities to those who wish to further their knowledge in the refrigerating field. For full information on membership, write to the Secretary, 435 N. Waller Ave., Chicago 44, Ill.

ENGINE ROOM POINTERS —



Generally It's Your Own Fault If You Buy Inefficient Machinery

MANY buyers commonly are heard complaining, after it is too late, about their machines being inefficient. They say that they were "stung." Thus in one typical instance the machine that was purchased was guaranteed to render a certain performance, but from the start it failed to do so. The guarantee was good for one year only. Both the manufacturer and user were to blame, this writer contends, because the machine certainly wasn't "as represented," and the buyer was too lenient. The manufacturer insisted that after a time, when the machine was properly "worn in," it would come up to the prescribed mark. But it never did, and the owner is still waiting. The year has passed and the guarantee is no longer active. The owner can't hold the manufacturer responsible any more. It is too late.

This, fortunately, does not happen as often now as it once did because most reliable manufacturers are willing to make good even after several years, guarantee or no guarantee. But the point is: there is seldom any excuse for buying inefficient machinery of any kind, unless one sets out to buy something cheap. Of course one can hardly expect a cheap product to be efficient. Before buying expensive machinery, though, one has several ways of determining beforehand whether or not that machinery will be efficient. Manufacturers are generally willing to make tests before the machine leaves the factory, and at these tests the buyer is allowed to have as many representatives as he wishes. After such tests are made to the full satisfaction of experts, there is seldom any possibility that the machines will go wrong or fall below guaranteed performance. It often pays to employ competent experts for the selection of machinery.

Lastly, if the machine doesn't fulfill the guarantee don't hesitate to ask the manufacturer to make good. Most present-day manufacturers are eager to make good, because, they know that any case of poor or unsatisfactory performance means a "black eye" for the manufacturer, and manufacturers don't like black eyes. In other words, don't buy from a manufacturer who is not responsible and who may be out of business tomorrow.

How Much To Pay for a Soot Blower?

GOING through an old correspondence file the other day I found that I endeavored to answer the above question by working out a "Rule" for anyone who might be interested in the subject of soot blowers. The rule is contained in the following:

Assuming that a soot blower for your boilers should pay 25 per cent on an investment, including interest, depreciation, and upkeep, the amount of money that can be spent for the blower can be figured as follows:

Take the average temperature of the chimney gas in degrees Fahrenheit before installing the soot blower and from it subtract the temperature that the soot blower manufacturer proposes to give as an average after installing the blower. Multiply this difference by 457. Divide the result into the heat valve per pound of the fuel that is being used. Then multiply by the boiler efficiency in per cent before installing the soot blower. Add one to the result. Then divide that into the number of tons of fuel burned per year and call the result A. Then multiply the number of boilers by 42 and call that B. Subtract B from A. Then multiply by the cost of fuel in dollars per ton, and, lastly, multiply that result by 4. The answer is the investment in dollars that can be made in soot blowers.

For example, if your annual fuel consumption in a given furnace is 10,000 tons of coal per year, heat value of coal 12,000 B.t.u. per lb., boiler efficiency before installation of the cleaner is 70 per cent, temperature before installing the blower 600 deg. F. and after installing an average of 550 deg. is promised (thus giving a temperature difference of 50 deg. F.), number of boilers is one, and the cost of the coal is $5 per ton, substitution in the above rule will show that you can afford to invest $4,460 in a blower for your plant.

In the above rule, it is assumed that 18 lb. of air is used per pound of coal as fired, that there are six blower elements in an average installation, that the boiler is cleaned four times per day, that the boiler is cleaned and operated 300 days per year, and that the average rate of evaporation is 6 lb. of steam for every pound of coal burned.—W. F. S.

Keep Oil in the Right Place

DO'S

Use suitable containers to catch oil drip.

If trays or pans are clean oil can be used for secondary lubrication even without filtering.

Install reliable fire protection equipment. Test at regular intervals.

Observe a regular routine for clean-up. Machinery looks better when clean; believe it or not, it usually runs better.

Collect oil soaked cloths in covered, metal containers. Wash them for re-usage.

Keep sand from fire-protection sand boxes away from oil containers. If necessary to scatter sand on the floor, spread carefully. Sand is an excellent abrasive if it gets into a lubricating system. It can stay in suspension in heavier greases or gear lubricants.

and DON'TS

Don't let spilled or dripped oils accumulate.

Wipe up promptly.

They are a fire hazard, also easy to slip on.

Fire extinguishers are not contagious nor are they coat racks. *Don't* hide them or cover them with rags or clothes.

Don't use lint-shedding rags or wiper cloths. Lint accumulations in circulating piping or oil grooves can stop flow of lubricants.

Don't let oil soaked wiper cloths accumulate. They are an excellent fire hazard.

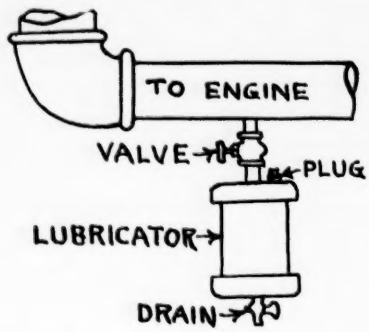
Don't regard sand as a substitute for a floor-cleaning job. Sand, like dust settling from the air is an excellent "sponge" for oil drip, and will develop into a dangerous hazard if allowed to accumulate.

Cleanliness even comes before godliness in the oil house or storage room. Another axiom also holds: Keep clean and live safer. The quitting whistle is always more musical than the ambulance siren.—The Texas Co.

A Simple Home-Made Lubricator

FOR emergency service you can make a surprisingly good lubricator out of ordinary pipe fittings—a lubricator that will actually "work." It won't "freeze" like some of the old lubricators that I have had experience with, and perhaps you have had similar experience.

The accompanying sketch shows plainly how to make this lubricator—out of two small nipples, one large nipple which I have marked "lubricator," a valve, a drain cock, two caps, and a plug. Suit yourself as regards sizes. Put them together as shown making everything steam tight, and your lubricator is complete.



Fill the lubricator with cylinder oil through the plug and then replace the plug. Then open the valve. Condensate will settle down beneath the oil because water is heavier than oil. The oil will then be lifted up by the condensate and will gradually flow out into the steam pipe and to the engine, pump, or whatever it is that you wish to lubricate. The rate of flow of the oil is readily adjusted by means of the valve.

The proper rate of feeding can be determined by occasionally draining out the water and refilling with oil. After a while you will get the "hang" of it and will know just how much to open the valve, how often to refill with oil, and so forth. At first it will be necessary to do some experimenting to determine the best valve setting. Keep tab on where you open it during each experiment. You will soon hit on the right spot.

"Eat" NOT "Heat"

JUST to show how a single letter of the alphabet can change the meaning of a sentence and cause considerable misunderstanding, this writer received a letter from a questioner not so long ago in which the questioner said, "This neutral water seems to heat through the iron shell of the heaters very rapidly."

The questioner wanted to know what to do, and the writer suggested insulation. That puzzled the questioner, so he wrote again and this time he made it clear that the word should have been "eat" instead of "heat." So the following reply was sent to the questioner:

"Please ignore my reference to insulation because insulation, of course, would do no good. What you need is a metal that will not be affected by the water you use, all of which you very likely know as well as I do. Your problem is very similar to the problem of condenser manufacturers. Pure copper tubes are sometimes specified for certain localities whereas bronze tubes are specified for other localities. There usually is a composition that is suitable for any given water in any given territory. Monel metal is one of the best corrosion resisters known. Whether or not it would pay you to install monel metal tubes I do not know, as you are more familiar with your volume of business than I am. It is quite possible that monel tubes are the very thing you need and I would suggest that you do some additional investigating."

How Much Money Do Anti-Friction Bearings Save?

THIS question is commonly asked today by refrigerating men: "How much do anti-friction bearings save as compared with plain sleeve bearings?" That question is very nicely answered for ball bearings by a report which I have before me. The report covers a total of seventy three tests in the plants of a number of representative industries such as refrigerating plants, textile mills, steam laundries, candy factories, steel mills, chemical plants, foundries, machine shops, etc.

The grand average of all of the tests shows that each bearing saved $13.62 per year in power,oil and labor. This means that the saving effected by the average ball bearing will pay for the bearing in 1.37 years. Or, stated in another way, the annual return on the investment is 75 per cent.

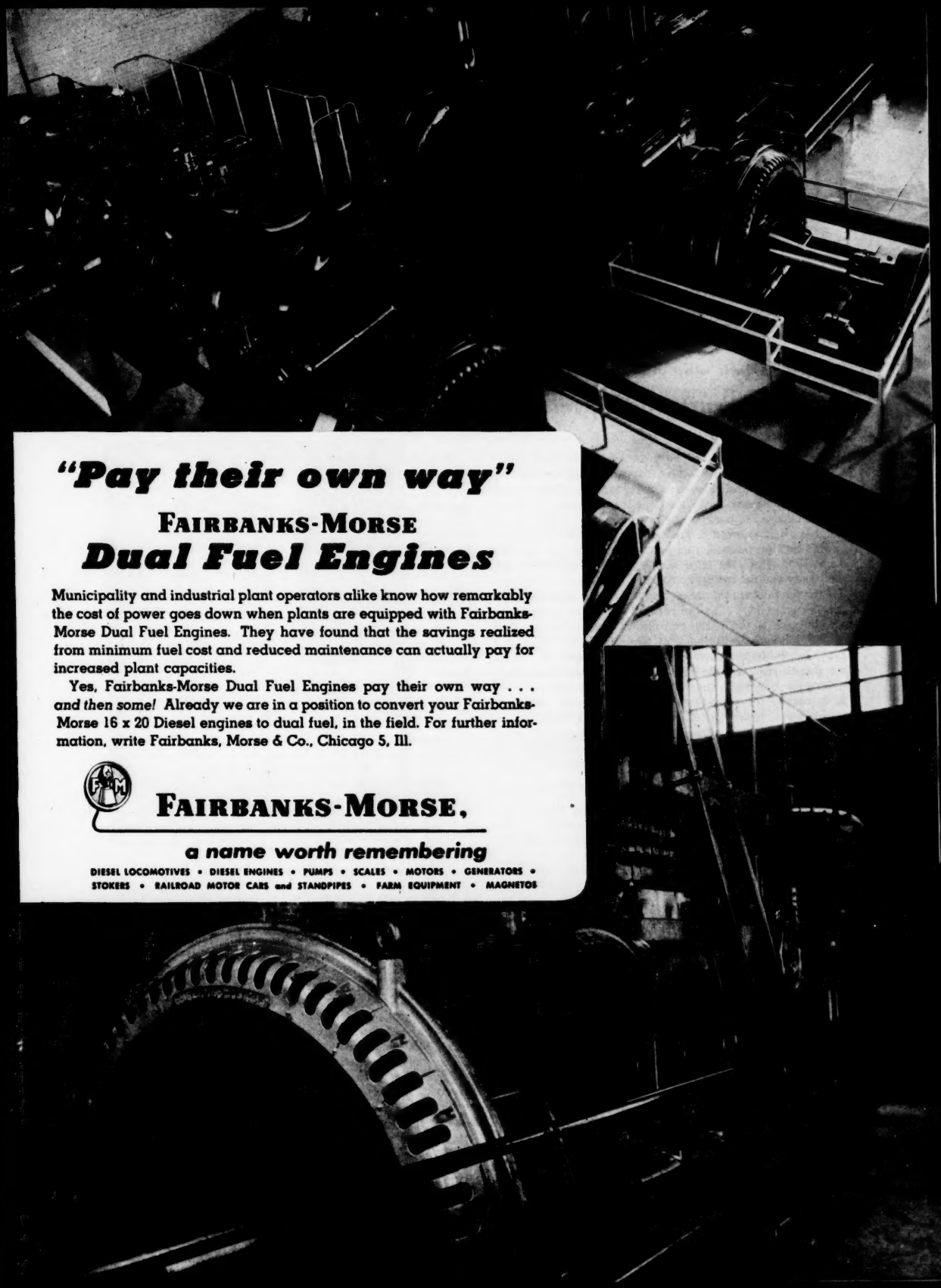
Of course this does not mean that EVERY bearing in the world should be an anti-friction bearing. It does not prove that EVERY ball bearing will save $13.62. Obviously, if the total cost yer year of power, oil, and labor, is less than $13.62 per bearing, it is impossible to save that much per bearing. Most of the manufacturers of today are honest. Certainly all of the successful ones are honest. They do not try to "put anything over" which they feel might react against them in any way. Therefore all responsible manufacturers of anti-friction bearings do not advocate anti-friction bearings under **all** conditions. They frequently recommend the use of plain bearings.—S. F. W.

Fuel or Lubrication More Important?

FOR many years one of the pet contentions by this writer has been that: "Lubrication is more important than anything else in the operation of an engine." One reader, however, does not agree. He writes that in an internal combustion engine "fuel" is more important than lubrication. His argument is that when an engine runs out of fuel the engine will stop. That is true, of course. However, such engines also come to a stop when they run out of lubrication. In fact, by the time they do come to a standsttill they are often ruined due to scoring. The mere running out of fuel, on the other hand, does not ruin an engine.

Anyway, when the writer made the above statement he took it for granted that there would always be sufficient fuel, that the engine would be strong enough to hold together, and that the journals would not get full of sand. And so on. Many things can cause an engine to come to a standstill.

The principal reason why the writer selects lubricant as being most important is that it is the "preserver" of the engine. It prevents wear. It increases efficiency. It makes for long life. Many engine operators complain about the high cost of lubrication. But, have you ever thought of the much higher cost of NOT lubricating an engine? Lubrication is most important. It is the "blood stream" of the engine.



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Frozen Fruit and Vegetable Packs Show Increases in 1948

INCREASES in packs of both frozen fruits and frozen vegetables during 1948 have been reported by the National Association of Frozen Food Packers. The frozen fruit pack increased to 377,660,000 lbs. in 1948, up about 9 per cent from the pack in the preceding year. The frozen vegetable pack showed a greater increase, totalling more than 446 million pounds; this pack was 29 per cent greater than in 1947. Both the fruit and vegetable totals, however, were below the record highs reached in 1946.

Totals for individual items showed both increases and decreases from 1947. In the case of fruits, the increase in the total pack in 1948 was due almost entirely to the tremendous increase in the pack of frozen strawberries and a sharp increase in the pack of frozen R.S.P. cherries. Most other frozen fruit and berry packs were down from 1947, and in some instances, the reductions were severe.

With regard to vegetables, the packs of green peas and cut corn were down appreciably in 1948, but these reductions were more than offset by increases in packs of other items. The expanded production of asparagus, green and wax beans, winter vegetables, and spinach was particularly significant.

Complete details of 1948 packs by region and by container sizes will appear in the regular Frozen Food Association pack statistics bulletins, soon to be printed.

PRODUCTION OF FROZEN VEGETABLES, 1946-1948 (000 lbs.)

Product	1946	1947	1948
Asparagus	28,316	10,737	18,321
Beans, Green & Wax	40,975	30,911	49,583
Beans, Lima	50,083	67,578	75,403
Broccoli	25,789	9,117[1]	29,126
Brussels Sprouts	13,521	4,557[1]	10,526
Carrots	9,069	2,905	15,393
Cauliflower	13,237	5,353[1]	13,963
Corn—Cut	42,427	26,559	20,920
Corn-on-Cob	2,296	6,064	10,324
Peas, Green	140,603	131,786	118,977
Peas & Carrots	7,186	5,302	6,510
Pumpkin & Squash	10,009	5,190	5,577
Rhubarb	10,566	1,538	2,629
Spinach	38,185	23,279	41,571
Succotash	3,410	3,763	6,879
Miscellaneous Vegetables	14,329	10,953	20,656[2]
Total	450,000	345,592[1]	446,358

1 Revised.
2 Includes mixed vegetables, french fried potatoes, peppers, okra, collard greens, turnip greens, other greens, and blackeye peas.

PRODUCTION OF FROZEN FRUITS, 1946-1948 (000 lbs.)

Product	1946	1947	1948
Apples & Applesauce	78,220	28,573	27,552
Apricots	43,571	6,007	2,477
Blackberries	19,750	14,510	9,745
Black Raspberries	5,516	7,116	4,519
Blueberries	10,240	5,407	7,661
Boysenberries	10,905	12,495	8,832
Cherries, R.S.P.	88,061	67,002	87,798
Cherries, Sweet	7,831	357	664
Currants	4,219	4,089	3,880
Gooseberries	1,430	93	44
Grapes & Pulp	12,445	20,975	5,511
Loganberries	3,017	2,299	4,174
Peaches	65,140	27,034	13,598
Pineapple	23,006	5,909	3,677
Prunes	14,106	2,843	2,125
Red Raspberries	23,905	25,401	23,198
Strawberries	78,059	109,036	160,077
Youngberries	1,766	1,161	663
Other Fruits & Berries	32,093	6,946	11,464[1]
Total	523,281	347,251	377,660

1 Other fruits and berries include bananas, cantaloupe, citrus peel, elderberries, grapefruit sections and juice, lemon juice, mixed fruit, orange juice (single strength only), pears, plums, and watermelon.

Preparing and Storing Frozen Eggs

TO GATHER facts on frozen eggs the Refrigeration Research Foundation has subsidized a project at Ohio State University under the leadership of Alden R. Winter. From the results of this study come the following practical recommendations:

Liquid egg should be placed in a freezer (minus 10 to minus 15 F.) as soon after preparation as possible. This and other studies have shown that freezing temperatures of 0 F., or slightly higher, will destroy bacteria faster than lower temperatures. This fact is important because it is contrary to expectation. It is important to recall certain facts in this connection, however. Other things being equal, the lower the room temperature, the more liquid can be stacked in it without raising temperature above 0 F., or if the temperature goes above 0 F., the quicker it will drop back to 0 F.

If the temperature goes much higher than 0 F. and stays there for several hours, liquid egg may sour or spoil before it freezes. This is especially true of large cans, in the center of the stack, and in rooms without forced air circulation.

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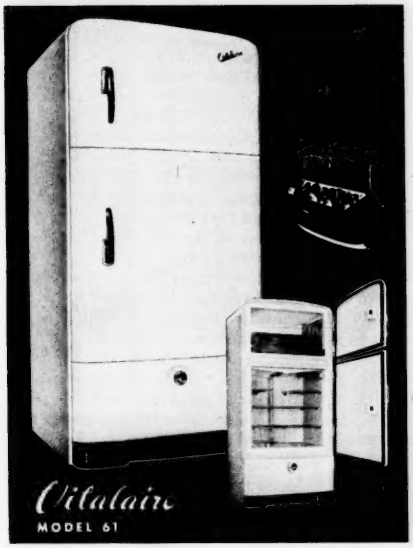

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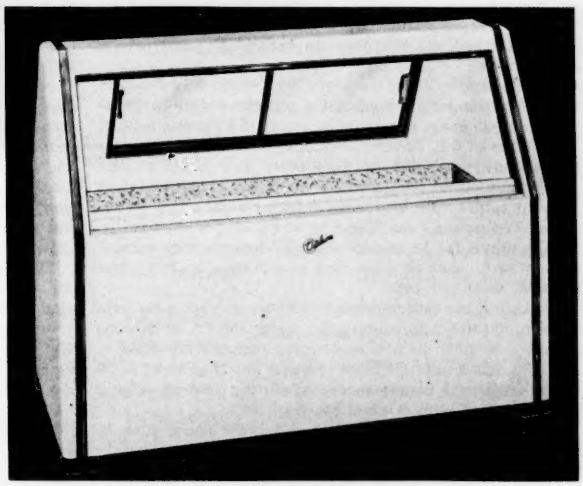

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Crushed Ice Capacity.....225 lbs.
Overall Dimensions: length 60⅛"; depth 28⅛"; height 43⅞"

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Storage of frozen egg products at 0 F. for several months killed as many bacteria as storage at lower temperatures did in these tests. About 90 per cent of the bacteria were destroyed during 6 months.

W. J. Finnegan's studies on freezing liquids show that expansion in cans of freezing liquids is due to internal pressures developed during progressive freezing. The core of concentrated egg liquid freezes last and expands at the top, forming a core that may cause popping of lids. Very rapid freezing, especially with forced air movement, builds the core higher. Slower freezing allows it to spread.

The exact heat transfer conditions that cause "lid popping' are not known. It is the writer's opinion that it will not occur to any significant extent in the range of minus 10 to minus 20 F. with forced air movement, and is found increasingly as temperature is lowered from minus 25 F. downward.

Temperatures of minus 10 to minus 15 are mentioned by U. S. Department of Agriculture authorities as most common commercially in Circular 583 (1941) and the warning is offered that excessive pressure might burst seams of cans if they are left too long in the freezer. It is recommended that they be moved as soon as frozen to storage at 0 to minus 5 F. Slush freezing before filling into containers avoids these difficulties.

Successful storage will also depend on quality of product. In addition to soundness, freshness and cleanliness of original eggs, other factors are important. Pasteurization at 140-142 F. for two minutes for whole eggs and at 143-135 F. for two minutes for white, will kill more than 99 per cent of the bacteria present in the product. Cleanliness in breaking plants is essential. Equipment should be cleaned at least four times a day and plants should be carefully planned and managed to avoid bacterial contamination. Candling detects many but not all eggs of low quality and high bacterial count.

Many kinds of bacteria found in eggs will grow under a wide range of temperature conditions. Early spring eggs yield products with lower bacterial counts than warmer-weather products. Most eggs contain no bacteria when laid, but immediately thereafter the shell becomes contaminated and despite washing of shells and the best of sanitary practices in breaking plants, liquid egg contains some bacteria. One single bad egg may contain billions of bacteria and spoil a batch.

Liquid egg in still air cools quickly (within a few hours) to the freezing point (about 28 F.), remains at this temperature about 20 hours in a room at minus 15 F. to minus 20 F, or 28 hours at 0 F. and then solidifies and falls quickly to a temperature near that of the room. Egg white freezes slower than either plain yolk or whole egg. Addition of 10 per cent salt to yolk lowers the freezing point about 20 degrees. Ten pound cans freeze in about 60 per cent of the time required for 30 pound cans. Moderate air movement against 30 lb. cans of whole egg may reduce freezing time as much as 50 per cent.

Defrosting is a critical matter, because surviving bacteria begin to multiply. In running tap water (58 F.) 30-lb. cans defrosted in 20 to 24 hours—at room temperature in 36 to 42 hours, but a mild air blast reduced this time to 20 to 26 hours. Bacterial counts increased during defrosting and the rate varied with original bacterial flora.

Whole egg defrosted at 55 F. had a lower count after 72 hours than egg defrosted at 68 F. had after 48 hours. Recommendations of QMC on holding and defrosting are: frozen eggs may be held at a maximum air temperature of 40 F. for a maximum of 72 hours, or at a temperature between 50 and 75 F. for a maximum of 24 hours to temper or partially defrost them. Defrosted product should be cooled to 45 F. or less and held at that temperature. The liquid should not be held more than 16 hours before it is used.

Summary

1. Quality in frozen liquid egg products is determined largely by bacterial content which in turn is affected by (a) cleanliness and soundness of original eggs, (b) sanitation and speed of handling into freezers in breaking plants, and (c) methods of freezing and storage.

2. When liquid egg products arrive at freezing plants or at storage plants, after freezing, they may be already sufficiently contaminated so that the best practices cannot protect them fully.

3. Freezing must be fast and thorough and should follow quickly after eggs are broken out. There is no sure way of knowing whether various lots will tolerate small or large deviations from best freezing and storage practices.

4. Keep freezing temperature at 0 F. or below, preferably with forced air movement. Store at 0 F. or below.

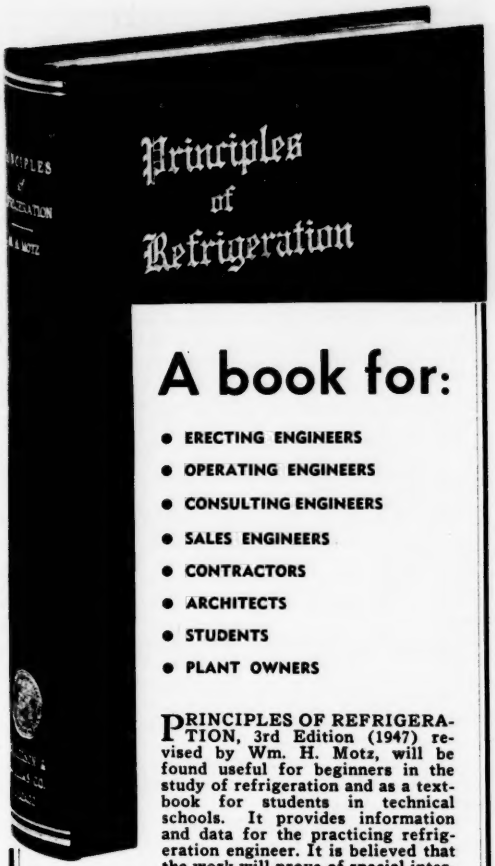
Government Standards for Frozen Fruits to be Issued

OFFICIALS of the federal Food and Drug Administration are preparing to issue a tentative draft of mandatory government standards to apply to major frozen fruits and berries. These standards will govern identity of the pack, and fill of container. A tentative regulation is expected to be issued about mid-July. The industry will have an opportunity to file exceptions or objections to the tentative order. A minimum of 20 days is allowed for such exceptions, and a maximum of 90 days if there are serious disagreements with the wording or provisions of the FDA regulation. It is thus apparent that the final order will not be published before sometime in the fall, and cannot become applicable before the 1950 pack.

The National Association of Frozen Food Packers has filed a complete suggested regulation and supporting arguments with FDA as a guide for the agency in drafting its own order. This proposed regulation took the stand that customers insist on different degrees of sweetness in the finished product, and on that basis the industry insisted on provision in the standards for light sirup packs, as well as for medium and heavy sirups. The packer group also explained that labeling in the interest of consumers needs only to show those facts which will permit the consumer to choose between different packages of the same item, and those facts which will influence the use to which the consumer will put the product. So far as other facts are concerned, the NAFFP contended, the industry believed that the standard itself is sufficient protection for the consumer. Because many packers foresee the possibility of important new developments in packing of frozen fruits and berries, the frozen fruit industry contended that provisions in the regulation must not restrict innovations.

The Food and Drug Administration conducted hearings for a good part of the summer of 1948 on its proposed standards for frozen fruits and berries and took lengthy testimony from government witnesses, consumer groups and packers' representatives. These are the major fruit and berry items for which standards will be provided: Apricots, blackberries, blueberries, boysenberries, dark sweet pitted cherries, light sweet pitted cherries, red sour pitted cherries, currants, gooseberries, grapes, huckleberries, loganberries, nectarines, freestone peaches, cling peaches, plums, red raspberries, black raspberries, strawberries, youngberries and rhubarb.

Up to this time, the Department of Agriculture has issued "tentative" standards of certain frozen products, but these have not had the force of law. The forthcoming FDA standards will be enforceable under the federal Food, Drug and Cosmetic Act.



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Frozen Concentrated Orange Juice

A SUMMARY of information on frozen concentrated orange juice has been published in a recent bulletin by The Refrigeration Research Foundation. The report states that the process that is used by several packers involves rapid, low-temperature evaporation (at 50 to 70 F.) and addition of pulpy single-strength juice back to the concentrated juice. Compressed ammonia vapor supplies heat for vaporization; water vapor from juice is condensed on the refrigeration side, thus reducing pressure in the evaporator to the point where the concentration takes place at low temperature.

The man chiefly responsible for this new method is J. L. Heid, who has worked many years in government and private-industry research. The method is covered by Public Service Patent No. 2,453,109, available for license from the U. S. Department of Agriculture. Mr. Heid's present position is Director of Research and Development, Florida Citrus Canners Cooperative, Lake Wales, Fla.

The method involves slush-freezing at 17 F. before filling into cans and hardening to a center temperature of 0 F. before casing. This method yields a product that shows little flavor change or settling when held at 40 F. for five days after reconstitution.

Other factors are (1) use of sound, fully matured fruit, selected and blended for uniformity, (2) excellent plant facilities to insure sanitation and microbiological control, as well as straight-line operation, (3) rapid cooling after extraction of juice.

Storage should be at uniform temperatures, not above 0 F. At plus 10 F., the concentrate begins to soften and deterioration becomes apparent when it is held an appreciable period at temperatures of plus 20 F. Improper maintenance of room or cabinet temperatures or careless handling during delivery can result in flavor damage which will blunt consumers' enthusiasm.

The outlook for orange concentrate is good, provided inferior products do not compromise the situation. The winter freeze in Arizona and California has caused an estimated loss of 24 per cent of fruits on trees January 1, which has increased the demand for oranges and citrus products. Damage to California citrus trees, however, has been slight and it seems reasonable to expect no effect on the 1950 crop.

Summary

1. Frozen concentrated orange juice in a sense represents a culmination in efforts to market the Nation's increasing citrus crops.
2. Current estimates state that 9 million gallons in Florida and over half a million gallons in California will be concentrated and frozen during the present year.
3. The initial phenomenal success and the gratifying public response suggest application to other citrus juices and other fruit juices.
4. Store at 0 F. or lower.

Plant Maintenance Show

THE first plant maintenance show, and exposition devoted exclusively to cost reduction through improved installation, operation and maintenance of equipment and services in factories, warehouses and other plants, will be held in the Auditorium, Cleveland, O., January 16-19 inclusive, it was announced recently by Clapp & Poliak, Inc., of New York, exposition management. Concurrently with the show, a four-day conference on plant maintenance methods will be held with L. C. Morrow, editor, Factory Management & Maintenance, as general chairman.

Chicago Section ASRE

THE monthly meeting of the Chicago Section of the American Society of Refrigerating Engineers was held Thursday evening, April 14, at the Builders Club. The speaker of the evening, Richard S. Dill, of the National Bureau of Standards, Washington, D. C., gave a very enlightening talk on "Insulation and Vapor Barriers for Refrigerated Spaces."

Mr. Dill described the test methods by which resistance to the transmission of moisture vapor is calculated for each commercial insulating material. A recent development in this field is the attempt to set up standards whereby laboratories all over the country could attain an "Approved" rating.

Among the experiments now in progress are many which tend to prove the old axiom of putting the vapor barrier on the warm side of the wall. Thus the barrier would be installed on the outside of a cold-storage room wall but on the inside of a house roof which was being insulated for winter.

The latest conclusion with respect to vapor-barriers in an insulated wall is to install only **one** membrane on the warm side, eliminating the intermediate layers that are so often installed between the blocks of rock cork. These intermediate membranes add nothing to the resistance to moisture-vapor flow if the outer one is really good, and they create the serious disadvantage of trapping moisture within the insulating material in case of a pin-hole leak in the outer membrane. In applications where an insulated wall is to serve a dual-temperature purpose a membrane is used at both sides of the wall, but the interior of the wall is mechanically ventilated from either side, whichever is the colder under the conditions of the experiment. Thus a 70 degree room would have its wall construction ventilated with room-air during the summer and with outside-air during the winter.

During the question and answer period following the paper Mr. Dill discussed practical application methods with the members.

One of the visitors was H. G. Venemann, professor of refrigeration at Purdue University. Prof. Venemann was introduced and said a few words on behalf of the Question Box section of the N.A.P.R.E. Department in ICE AND REFRIGERATION, requesting members of the A. S. R. E., qualified to do so, to answer some of the questions in such form that they could be published.

Officers Elected

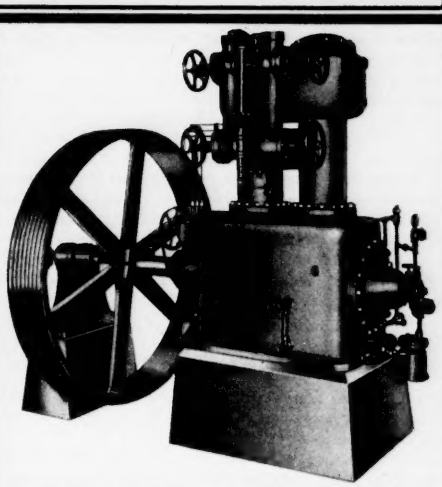
Officers were elected for the coming year as follows:
Chairman, Leon Buehler, Jr.,
Executive Vice-president, Fred P. Neff,
Second Vice-president, C. L. Eichstaedt,
Secretary, J. S. Hansen,
Treasurer, Ken Wolcott.

Ammonia Kills Fish in River

A HEAVY solution of ammonia apparently dumped into the Mamaroneck River at White Plains, N. Y., from a dismantled ice plant of the Rubel Corp., killed large numbers of fish, eels, frogs and turtles. The stream apparently had been polluted for a distance of 4½ miles downstream from the plant, according to Richard M. McLaughlin of the Westchester County Health Department.

Because of the large destruction of fish and other water life, Edward T. Townsend, game warden, representing the New York State Conservation Department, said he would make an investigation of the introduction of the ammonia and file a report with the Conservation Department.

Sterling



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5 Reduces possibility of costly shut-downs and repairs

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ALLIED CHEMICAL & DYE CORPORATION
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Health Necessity of Refrigeration Booklet for Foreign Markets

WITH the release of a fourteen-page color brochure "To Your Health," manufacturers of commercial and industrial refrigerating machinery opened a promotional campaign designed to convince foreign governments that refrigeration is essential to a nation's health, economic security, and progress. Planned and sponsored by the Foreign Trade Committee of the Air Conditioning and Refrigerating Machinery Association under the chairmanship of A. J. Dangoia, Westinghouse Electric International Co., this educational effort will be continued for several years.

The brochure, profusely illustrated and with a minimum of text, makes seven salient points that:

(a) Refrigeration Is a Necessity
(b) Refrigeration Saves Food and Money
(c) Refrigeration Creates Wealth
(d) Refrigeration Promotes National Growth
(e) Refrigeration Speeds Industrialization
(f) Refrigeration Spurs Progress
(g) Refrigeration Builds Security

Refrigeration for Foods

Emphasizing the fact that comparatively little refrigeration is used outside the North American continent for food preservation, in comparison with the world's needs, the booklet states that "the annual destruction of food, from improper storage alone, amounts to 18 billion tons—enough to feed a nation of 48,000,000 people for a year." It is believed that, in addition, many times that amount of unstored food is lost each year through spoilage.

It makes the point that, with proper refrigerated storage of food, a nation will not only improve the health and productivity of its people, but provide a surplus for use in times of poor harvest or for sale to other nations in exchange for needed goods and services. A further result of the use of refrigeration is an improvement in agricultural methods, producing a larger and more varied volume of food with less manpower, and releasing workers from agriculture to further the industrial progress and increase the wealth of the nation.

Because of lack of knowledge of the essential and varied uses of refrigeration, some foreign governments consider refrigeration a "luxury item" and are therefore reluctant to release foreign exchange for its purchase. One of the primary objectives of this campaign is to clarify any misconceptions these potential buyers of refrigeration equipment may have.

Added Applications Follow

The ACRMA Foreign Trade Committee plans to follow this initial presentation with further publications on specific applications of refrigeration and air conditioning for commercial and industrial uses. The Committee also plans to translate this booklet and succeeding ones into Spanish and probably other foreign languages. Overseas distribution of the publication is being made by the field representatives of ACRMA member-companies who will use the booklet in meetings to be held with officials of foreign governments.

Distribution of the booklet in the United States is being handled by ACRMA's headquarters, Southern Building, Washington, D. C. Copies have been sent to interested congressional and government department committees, to United Nations Organization committees, and other national and international groups concerned with improving the health and standards of living of the world's population.

Book Review

REFRIGERATION PRINCIPLES AND PRACTICES, by Norman Sharpe, Chairman of Refrigerating and Air Conditioning Dept., California State Polytechnic College. 398 Pages. Illustrated. Published by McGraw-Hill Book Co., New York. Price $4.00. For sale by Nickerson & Collins Co., Chicago 44, Ill.

This book, according to the author, was written for the purpose of assisting the student to integrate principles and practices of the refrigerating industry. Material is presented in the order in which the engineer would make calculations for a typical installation. This order is offered as a suitable one for instructional purposes. The first chapter, dealing with the refrigeration load, gives the student a review of the fundamental principles of physics required. The second chapter gives the chemical and thermodynamic properties of the common refrigerants. The third chapter presents thermodynamic cycles and their use with the various refrigerants. Throughout the rest of the book, principles and practices are discussed in close relation with each other. Numerous diagrams are used to illustrate examples and procedures.

Evansville Chapter A.S.R.E.

THE regular meeting of the Evansville, Ind., Chapter, American Society of Refrigerating Engineers was held Tuesday evening, April 5.

Poorly managed material and inventory control can cause an industry a staggering sum of money according to the speaker of the evening, James H. Elliott, refrigeration division inventory and supply manager for International Harvester Co. Care must be taken, he said, to avoid overbuying material, for the price could drop, with the manufacturer holding the bag. At the same time enough material must be bought to assure a steady supply to the production line, or expensive delays are involved. Tight control must be maintained to avoid over-production. The manufacturer might get caught in a falling market with high priced merchandise. This involves being constantly on guard against over-optimism on the part of the sales and production departments. It requires close study of marketing conditions and trends, while keeping an eye on material prices.

Dr. John Kronsbein of the Evansville College engineering department, was in charge of the demonstration after the meeting. With equipment from the college and several Evansville industries he showed electlytic methods of polishing metals. The post-meeting demonstration has become a regular feature of the Evansville Chapter meetings. Actual equipment for various processes is set up and operated.

Standards for Insulating Board

A RECOMMENDED revision of structural fiber insulating board (TS-4777), has been submitted to producers, distributors and users for acceptance according to an announcement of the Commodity Standards Division, National Bureau of Standards.

Proposed by the Insulating Board Institute, with the endorsement of the Standing Committee, the recommended revision includes Class F, interior boards (flame retardant surface); additions to Table 2, covering physical requirements for tensile strength perpendicular to surface, together with illustrations and methods for testing.

Mimeographed copies of the recommended revision (TS-4777) are available and may be obtained, as long as the limited supply lasts, from the Commodity Standards Div., National Bureau of Standards, Washington 25, D. C.

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Scale and Corrosion

in Refrigeration Plant Equipment with

Newly Perfected

Water Conditioning Chemicals

Recently developed applications of the newer colloids and surface-active agents in Wright Chemicals for the refrigeration industry result in *improved* water conditioning—*positive* scale and corrosion control. Wright Chemicals contain 100% soluble, available chemicals—no waste or inert matter—insuring increased operating efficiency and reduced cost.

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Wright improved chemicals are the result of intensive study and research by men with years of experience in the development, production, application and control of water-conditioning problems.

Wright has no one cure-all to solve all problems. Each receives individual treatment. The Wright field engineer, who will call on you upon request, will obtain all necessary information and samples for examination in the modern Wright laboratory. Analyses are interpreted in view of the supplemental information received, and recommendations made in the form of a proposal. Clients are provided with regular laboratory service as a periodic check upon conditions.

There is a Wright Field Engineer near you, anxious to help solve your scale and corrosion problems. Send for New Bulletin giving full information on Wright Chemicals and their application.

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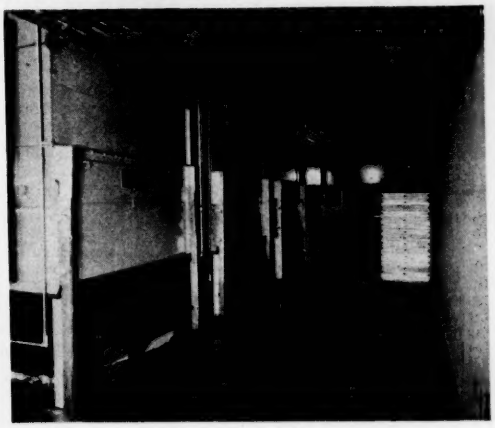

● The NIAGARA "NO-FROST" METHOD assures uniform temperature without loss of capacity from frosting of refrigerating coils at any time.

By preventing frost accumulation, it not only does away entirely with the nuisance of defrosting. It sets a new and higher standard of refrigeration system performance...free from operating difficulty and maintenance trouble...and with lower costs, because you always get the full capacity of your compressor without the waste of power that comes from running with frost on the coils.

NIAGARA "NO-FROST" installations are operating successfully in every refrigeration application requiring temperatures below freezing...meat chilling and holding, pre-cooling and holding of fruits and vegetables, butter, egg and cheese storage, fish freezing, quick freezing of foods, ice cream hardening.

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NATIONAL FROZEN FOOD LOCKER ASSOCIATION
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Stevens Hotel, Chicago, Ill.
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DELTA STATES ICE ASSOCIATION
November 28-30, 1949
Buena Vista Hotel, Biloxi, Miss.
R. N. MILLING, Secretary

Fires and Accidents

Milton, Ore.—The F. G. Lamb & Co. packing house and processing plant was burned to the ground recently. Damage was estimated at $250,000. Through the efforts of the firemen the fire was confined to the block long processing plant. Other buildings threatened by the blaze were the quick freeze and cold storage plant also owned by the F. G. Lamb & Co., the Milton Ice and Cold Storage Co., and the Majonnier & Sons packing house.

Memphis, Tenn.—A temporary side wall of corrugated metal on wood framing was blown out by an explosion in the engine room of the Tennessee Quick Freezing and Storage plant here. The adjoining offices were littered with broken glass. No one was injured for the explosion occurred at 7:30 a.m. April 19, before employees went on the job. The plant contains about 300,000 cu. ft. of storage capacity, but there was no loss of merchandise in the storage rooms because the equipment, except the damaged compressor, continued to operate.

Sales and Reorganization

Grand Rapids, Mich.—The ice business of the Collins Ice & Coal Co. has been purchased by the City Ice & Fuel Co., and will be consolidated with the Consumers Co., a City Ice & Fuel subsidiary. The Collins concern will extend its present storage facilities to include cooler, dry and freezer storage.

Binghamton, N. Y.—Ronal W. Grover has taken over the cost storage, locker plant and ice manufacturing business of the Binghamton Refrigerating Co., and will operate under the name of Binghamton Cold Storage.

Bristow, Okla.—The French Ice Co. has purchased an ice plant at Norman, Okla. L. V. Turner who has been manager of an ice plant at Frederickstown, Mo., will be in charge.

South Carolina Kills Bill Requiring Textile Mill Air Conditioning

THE House of Representatives of South Carolina by a vote of 53 to 45 killed a bill which would have required air conditioning of textile mills in the state. Prior to its rejection, the bill had been modified to lighten temperature requirements to a point where the measure's terms could have been met with air wash, rather than refrigerated, air conditioning systems.

Opposition to the bill was based on the contentions that it would be costly to South Carolina manufacturers and would keep new industry from coming into the state. The South Carolina Cotton Manufacturers Association had estimated that the refrigerated systems called for by the original bill would have cost the industry $40,000,000. The association said that textile mills in South Carolina already are air conditioning their plants as rapidly as economic conditions permit.

Similar compulsory air-conditioning proposals have been rejected in Georgia and North Carolina.

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Paul F. Hoff, Secretary, 1300 East Locust St., Milwaukee, Wis.

Natural Ice

Laramie, Wyo.—Supt. Homer Whitlock of the Pacific Fruit Express Co. ice plant here reported that the unusually cold winter produced a record ice harvest. The season's harvest was 88,000 tons of ice, the greatest in this plant's 28-year history. Three cuttings were obtained for the first time on record.

New Incorporation

Glasgow, Ky.—The Warren County Ice & Water Co. was chartered recently with a capital stock of $80,000. Incorporators are J. P. Gray, R. C. Wilson, James Norris Gray, L. T. and William L. Risen, all of Glasgow.

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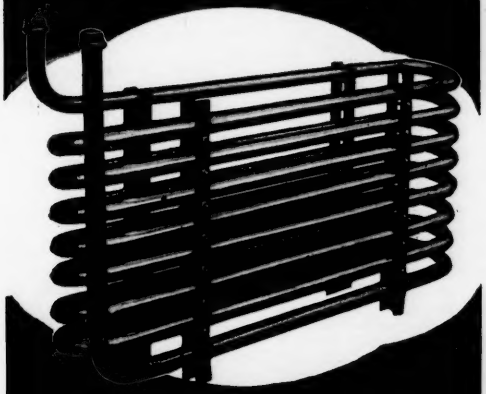
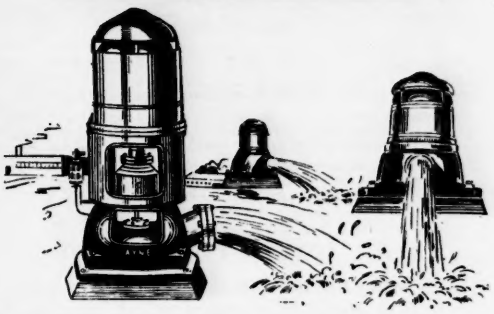


For over sixty years, the National Pipe Bending Coils have proved their quality in Ice and Refrigeration plants

BIG OR LITTLE

They All Have the Same Layne Quality



Layne has constantly maintained the highest quality of materials and finest precision manufacturing in all of their Well Water System installations. The smallest are just as substantial in construction and as high in efficiency of operation and always produce proportionately as much water as the biggest. This fact has been proven time and again to the complete satisfaction of hundreds of owners.

When Layne builds a Well Water System, more than fine casing, impellers, shafting, motors and skillful manufacturing are used. Layne's reputation extending back over nearly three quarters of a century as the world's most capable well water developers is included.

All Layne Well Water Systems are equipped with the famous high efficiency Layne Vertical Turbine Pumps. These pumps are designed and manufactured exclusively in Layne's own plant where every detail of their construction and assembling is under the supervision of engineers.

Write for catalogs and information about Layne's complete service which includes surveys, water strata explorations, pump installations, etc., for a complete Well Water System. Address LAYNE & BOWLER INC., General Offices, Memphis 8, Tenn.

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NEW PLANTS AND IMPROVEMENTS

Information pertaining to proposed new plants utilizing refrigerating equipment, as well as additions, improvements, and rehabilitation of existing plants. News regarding such new plants and additions is invited for publication in this department.

ARKANSAS

Lonoke, Ark.—Lilburn Reed, owner of the Lonoke Ice plant states that he has installed new equipment that will enable him to offer to this community, processed ice.

Magnolia, Ark.—L. H. Schultz, manager and part owner of the Home Ice Company, announces the opening of a new ice plant. The new plant can produce 30 tons of ice each day. The freezing equipment is electrically operated and entirely automatic. The storage capacity is 70 tons of ice. The company sells ice in both block and crushed forms. Also sold at the plant are ice refrigerators.

CALIFORNIA

Delano, Calif.—A new reinforced concrete cold storage plant, with a capacity of 125 cars, is being erected here at a cost of $231,000 for Antone Caratan, fruit shipper, by Trewhitt, Shields and Fisher Construction Co., of Fresno, Calif. The plant will have about 21,200 square feet.

San Francisco, Calif.—The Western Ice Co. in 1948 spent $200,000 for expansion of its facilities.

Tracy, Calif.—Tracy Ice & Development Co. has completed installation of a third S & S ice vending station.

COLORADO

Denver, Colo.—The Lamar Produce and Cold Storage Co. of Lamar has opened a branch here according to announcement made by Halsey Fuller, manager of the Lamar plant. The firm is located at 1637 Market St. and will be operated by Harry and Irving Wasko.

KANSAS

Wichita, Kans.—The City Ice Delivery Co. recently installed another S & S ice station Model 20-B to vend 25 and 50 lb. pieces of ice as well as 10 lb. bags of processed ice.

KENTUCKY

Carlisle, Ky.—Construction of a concrete block building which will be used as an ice storage plant, has been started by Raymond King on Walnut St. near the Carlisle mill.

Louisville, Ky.—Model 1410 Polar automatic ice station and four vendors have been installed by the Jefferson Ice Company.

LOUISIANA

Bastrop, La.—Bastrop Ice Co., located on East Cypress St., announced recently the opening of new branch ice stations at Mer Rouge and Sterlington, La.

Opelousas, La.—The Opelousas Ice Co. has installed a model 148 Polar aluminum ice station.

MINNESOTA

Minneapolis, Minn.—Cedar Sanitary Ice Co. last month established another 24-hour automatic ice depot with an S & S Ice vending station.

Minneapolis, Minn.—Banlowe's Beverage Co. has added a Model 2212 Polar Station to vend 25 and 50 lb. cakes and 7½ lb. bags ice, automatically.

St. Paul, Minn.—Citizen's Ice Co. has installed a Model 2010 Polar Automatic Station with four cake and bag vendors.

Wayzata, Minn.—Cusick's Blvd. Service has added a Model 2212 Polar Station. This is an automatic model equipped with both cake and bag vendors.

MISSOURI

California, Mo.—The California Ice Plant is in operation again after being closed during the winter.

Kansas City, Mo.—The Will Wyant & Son Sales Company here has gone into the cold storage business, building two 20-car units for fresh fruit and vegetable storage. This firm still has about a 100-car space for dry storage.

MONTANA

Townsend, Mont.—Bruce's 76th Station has installed 24-hour automatic with a Model 169 Polar Station for vending cake and bag ice.

NEW MEXICO

Gallup, N. Mex.—Clarke Sanitary Dairy is adding sufficient refrigeration equipment and facilities to their existing plant to supply ice to the citizens of this town, D. B. Clarke, owner, stated recently. This firm will replace the Gallup Mercantile Co.

NEW YORK

Angola, N. Y.—Angola Ice Co. has installed additional S & S ice vending equipment for dispensing both block and processed ice.

Watertown, N. Y.—Work will get underway soon on an extensive repair and expansion program on refrigeration facilities at Pine Camp. The cold storage warehouse will be expanded.

OHIO

Tiffin, Ohio—Four 20 ft. Polar vendors have been installed by the Smith Ice and Coal Co.

OKLAHOMA

Granite, Okla.—Polar cake and bag ice vendors have been installed at the Modern Ice plant.

Sentinel, Okla.—The Sentinel Ice plant is planning an extension, according to George Drake, owner and manager. The new addition will be an L shape with a 70x11 ft. room on the south and 30x54 ft. room added to the east side.

Tulsa, Okla.—Banfield Frozen Foods, 30 S. Lewis, has completed an expansion program centered around the building and equipping of a new cooler which measures 22x40 ft.

SOUTH CAROLINA

Greenwood, S. C.—Crystal Ice Co. has installed a 14 ft. Polar Ice Vendor.

TEXAS

Amarillo, Tex.—The Amarillo Ice Co. is installing a model 1610 Polar Station with two cake vendors and one bag vendor.

Borger, Tex.—El Reno Ice Co. has ordered two No. 16 Polar Vendors.

Longview, Tex.—The Independent Ice Co. has installed a model 1410 Polar Automatic Ice Station.

Lufkin, Tex.—The M. B. Morgan Ice Company recently completed the erection of a 624-can ice plant here. Frick equipment was used.

WASHINGTON

North Richland, Wash.—North Richland Ice Delivery Co. has installed two additional S & S automatic ice vending stations.

Yakima, Wash.—Artificial Ice & Fuel Co. has taken delivery of a third S & S ice vending station.

Always DEPENDABLE...

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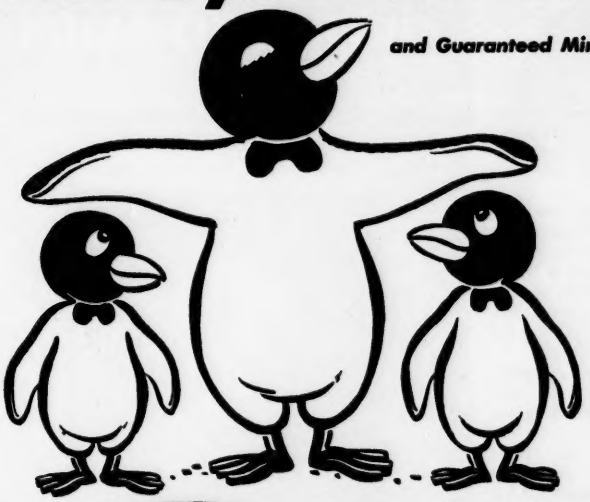

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Bulletins give full information on sizes and capacities of the following Binks Rotojet Nozzles:

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OBITUARY

Samuel Rubel

THE death of Samuel Rubel, New York City, president of the Rubel Corp., coal and ice, New York; The Mountain Ice & Fuel Corp. of New Jersey, and of the Ebling Brewery, the Bronx, occurred April 29 in his home, Sunset Hall. He was 66 years old. He was stricken with cerebral thrombosis in his office in Manhattan two days before his death.

The career of Samuel Rubel verged on the fabulous. Born in Riga, Latvia, he came to the United States at the age of 21 and began as a peddler of ice and coal in Brooklyn. His first route was the north side of Watkins St. in the east New York section. He covered it with a horse and wagon. A competitor covered the south side of the street. Up the tenement stoops Mr. Rubel personally carried his cakes of ice and bags of coal.

His next move was to a coal platform, with an office on Pitkin Ave. "That year I started selling to other peddlers," he said later. So the business grew until he was able to afford the shipping of coal by rail. He coined the catch phrase, "One good ton deserves another." In 1925 he bought the majority stock of the Ice Service Corp., and also bought out two other firms. Asked the value of all his properties at that time, he estimated them at thirty million dollars.

Two years later his firm was merged with the Commonwealth Fuel Co. and the Putnam Coal & Ice Co. The new concern, the Rubel Corp. of which he became head, then had thirty-five coal pockets, forty ice factories and fifty coal and ice stations in the greater City of New York. The same year Mr. Rubel bought the Ebling Brewery then in trouble with prohibition authorities for the manufacture and sale of beer. He planned to convert it into an ice cream factory.

During those years Mr. Rubel was not infrequently involved in legal tangles himself. Once he was indicted for conspiracy to drive competitors out of business, and on another occasion a partner sued him for six million dollars charging fraud. The indictment was subsequently quashed and the suit settled, but in 1934 he had to pay a $250 fine for contempt of court after a ruling of the Appellate Division saved him from a ten day jail sentence on the same count.

Mr. Rubel was active in charitable endeavors, particularly in behalf of orphan children. In 1933 he entertained more than 10,000 orphans at his expense at Coney Island as part of the celebration of the sixty-fifth anniversary of the Ebling Brewery.

Besides his widow, Mrs. Dora Nachmowitz Rubel, he leaves two daughters, Mrs. Bernice Ross and Mrs. Honora Shapiro, both of Roslyn, New York.

ARTHUR A. HYMEL, Memphis, Tenn., for over 21 years an employee of Railway Ice Co., died April 30 at his home in Memphis. He was 52 years old. He moved to Memphis seven years ago, before which time he traveled for Railway Ice out of New Orleans.

ROBERT L. DOLAN of Pittsburgh, Pa., who had been employed by the Consolidated Ice Co. for 60 years, died April 25. He was 74 years old. He was a former superintendent of the eastern division of Consolidated Ice.

Frank E. Fregeau

THE death of Frank E. Fregeau, for many years head of the Northern Cold Storage & Warehouse Co., Duluth, Minn., occurred January 19 after a brief illness. He was 70 years old.

Mr. Fregeau was born in Superior, Wis. Beginning his business career as a Western Union telegraph messenger, at 19 he became assistant agent in Superior for the Duluth, South Shore & Atlantic railroad. Promoted to station agent in Michigan soon after joining the line, he was at one time the youngest station agent of his day.

Frank E. Fregeau

He came to Duluth in 1900, accepting immediate employment with the First National Bank. He served in various posts until 1906 when he resigned to become a founder of the Northern Cold Storage & Warehouse Co. Under his administration this concern became nationally known as one of the leading refrigerated warehouses.

A prominent participant in civic affairs, Mr. Fregeau identified himself with a large number of community projects. An active sports enthusiast, he sponsored a number of athletic events in his earlier years. He was an active member of the National Association of Refrigerated Warehouses.

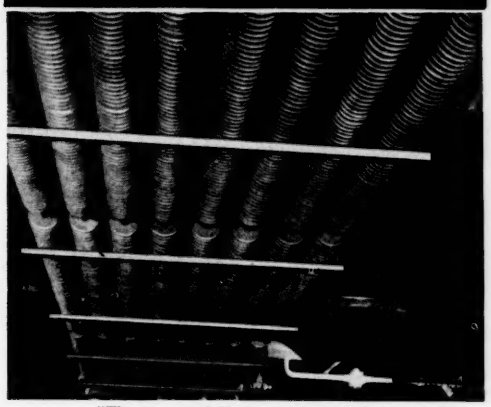
He was a member of Kitchi Gammi Club, the Duluth Chamber of Commerce, the Northland Country club, and the Rotary club. He was a director of the City National Bank of Duluth and a member of Our Lady of the Rosary Catholic church.

LEO G. HETZLER, president and treasurer of Hetzler Brothers Ice Co. Inc., Rochester, N. Y., founded by his father, the late George J. Hetzler, died April 14. The elder Hetzler established the company at 801 Driving Park Ave. 74 years ago. After his death, his three older sons, William, Frank and John Hetzler, conducted the business. Leo Hetzler entered the firm 38 years ago as president and secretary, succeeding John, who left the company to join the Sheriff's Office staff.

LUTHER HART CARR, owner of the Excelsior Ice Co. and of the Vaughan Light & Power Co. of Vaughan, N. Mex., died at his home at Excelsior Springs, Mo., March 15. He was 78 years old.

NEW HOWE POLAR CIRCLE COILS

Sensational 6-way Savings!



"The most remarkable low temperature coils I ever used," writes Mr. A. of Alabama.

YOU SAVE: PRICE • SPACE • LABOR • WEIGHT REFRIGERANT • FREIGHT

A REVOLUTIONARY STEP in refrigeration efficiency and economy. Perfect for meat packers, quick freezing plants, cold storage plants, ice plants, ice cream plants. These amazing new HOWE POLAR CIRCLE COILS are built for heavy duty use in both coolers and freezers. Provide greatly improved refrigeration that assures better product control. Developed out of Howe's 37 years of specializing in refrigeration problems. *Proved* by on-the-job testing! Big Savings in all six ways over bare pipe coils!

IMMEDIATE DELIVERY - WRITE FOR DETAILS

***FOR ALL REFRIGERATION PROBLEMS** consult Howe, since 1912 manufacturers of ammonia compressors, condensers, coolers, fin coils, locker freezing units, air conditioning (cooling) equipment*

HOWE

ICE MACHINE CO.

Distributors in Principal Cities • Cable Address: Himco, Chicago

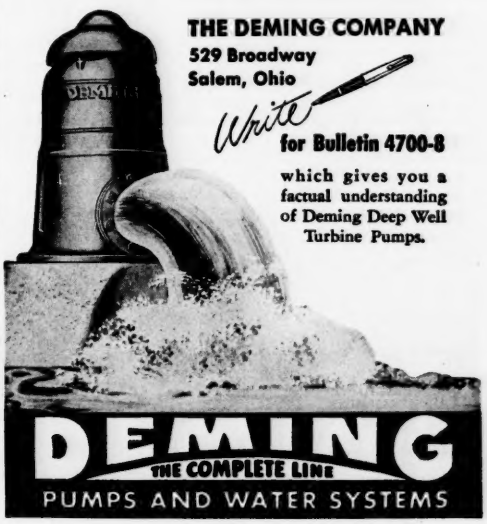
2829 MONTROSE AVE. • CHICAGO 18, ILLINOIS

Available: A few territories for new Distributors. Your inquiry will receive our prompt answer.

Ask a Deming Distributor how to cut water costs

Can YOUR company afford to overlook potential savings in operating costs? Consider, for example, your present costs of water. Are you SURE that no economies can be obtained? If not, we suggest that you write us for the name of the Deming Distributor nearest your plant. He will be glad to discuss the subject with you. He will explain how other companies in your industry have made substantial reductions in their costs of water by installing Deming Water Lubricated Deep Well Turbine Pumps.

These highly efficient pumping units are available in a wide range of capacities up to 3000 gallons per minute and are obtainable with the various types of heads for any power drive conditions.



THE DEMING COMPANY
529 Broadway
Salem, Ohio

Write **for Bulletin 4700-8**

which gives you a factual understanding of Deming Deep Well Turbine Pumps.

DEMING
THE COMPLETE LINE
PUMPS AND WATER SYSTEMS

C. Neal Barney

C. Neal Barney

THE death of C. Neal Barney, vice president, secretary and general counsel of Worthington Pump & Machinery Corp., New York City, occurred at his home in Scarsdale, N. Y., April 24, at the age of 73 years.

Mr. Barney was a native of Lynn, Mass., graduated from Tufts College in 1895; took his law degree at Boston University and then returned to Tufts for further post-graduate study. Later he was a lecturer at the law schools of both Northeastern and Boston Universities. He was a Republican Presidential Elector in 1908, and a former mayor of Lynn. He was chairman of the legal advisory committee for the draft board in Lynn during World War I. He was also a trustee for Tufts from 1909 to 1921.

He joined Worthington as chief counsel and secretary in 1918; was appointed secretary-treasurer in 1932; and was elected vice president and secretary in 1942.

At the time of his death, he was president of the Maria Mitchell Association, Nantucket, and was a member of Theta Delta Chi, Phi Beta Kappa, the Society of Mayflower Descendants, the Newcomen Society, the Pacific Club, the University Club and the Massachusetts, New York State, and American Bar Associations.

Frederick C. Johnson

THE death of Frederick C. Johnson, ice dealer at Norfolk, Va., for nearly forty years, occurred in a Norfolk hospital March 16. Mr. Johnson, who was 68 years old, retired three years ago because of ill health. A native of New York, he came to Norfolk 60 years ago. The F. C. Johnson Ice Co. which was operated by him, served the entire city but his delivery vehicles covering the Willoughby area were particularly popular. It was said that residents of that resort area could keep time by the morning and afternoon deliveries so exact were their schedules.

NEW AND IMPROVED EQUIPMENT

MACHINERY-APPLIANCES-PROCESSES

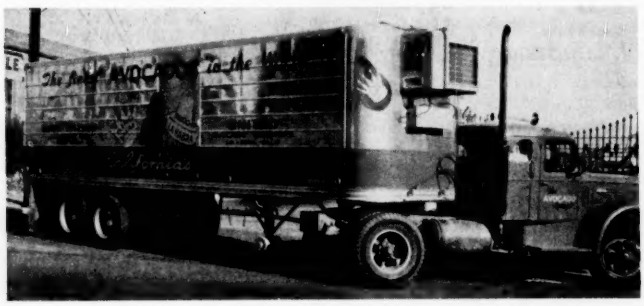
Information contained in this department is furnished by the manufacturer of the article described and is not to be construed as the opinion of the Editor.

Heavy Duty Truck Refrigeration Unit

A RECENTLY introduced truck-trailer mechanical refrigeration unit makes possible the transportation of "hot" loads as well as products requiring sub-zero temperatures. Fruits and vegetables may be loaded directly from the field into the refrigerated trailer, without precooling, and the new Thermo King Model "R" unit will cool the produce in transit. Already, new applications for the machine have been found; for example, the hauling of cut flowers which must be kept under correct temperature and humidity conditions.

The new Model R is the third model in the line manufactured by the U. S. Thermo Control Co., Minneapolis, specialists in gas engine powered refrigeration. A one-piece, factory packaged machine, the Model R is installed in the upper nose of the trailer and extends only 26 inches into the trailer. Cold air blown from the unit circulates through the cargo, thereby insuring complete refrigeration of the load. The design of the system prevents drying out of moisture-laden products.

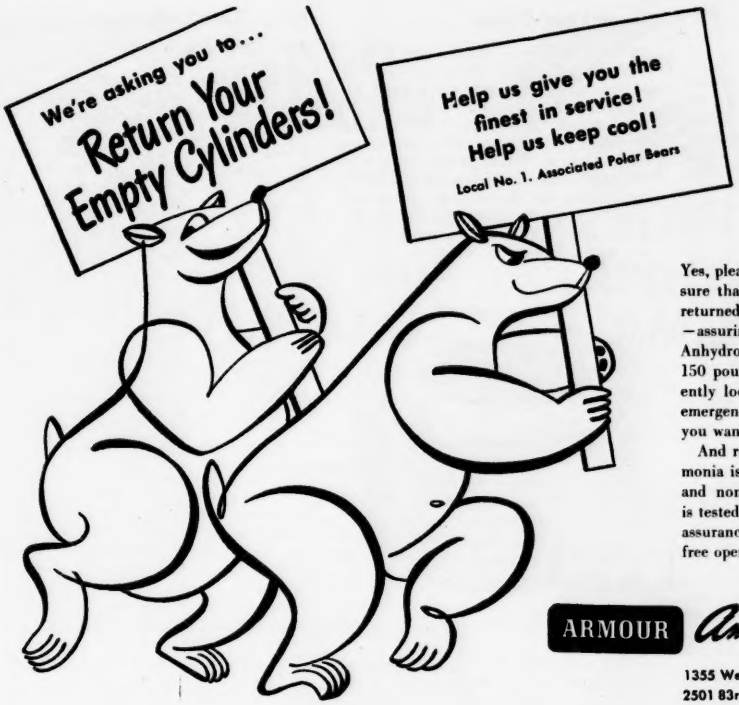
Operation of the Model R is fully automatic once the desired temperature has been set and the starter switch turned on. A feature of the unit is that it is a combination heating and cooling system, so that required temperatures can be maintained regardless of outside temperatures. Many firms daily haul perishables from coast to coast, or from one section of the country to another, where outside temperatures vary from one extreme to the other; and Thermo King units maintain a closely controlled product temperature.



Refrigerated truck trailer used for hauling California fruits

York to Make Recold Coils

UNDER the terms of a license agreement recently signed between York Corporation, of York, Pa., and Refrigeration Engineering, Inc., of Los Angeles, York will manufacture certain refrigeration coils using the water defrost method. The water defrost method, which was patented by Recold in 1940, employs the use of ordinary tap water for defrosting the refrigeration coil. The coil can be defrosted while maintaining, within the refrigerated space, a temperature below freezing. This is done by supplying water from a source outside the refrigerated space to the spray head, whence it is sprayed on the coil, caught in the drip pan, and drained therefrom by one of the conduits. Unused water remaining in the spray head is drained by the other conduits. By these conduits all water is removed from the refrigerated space without being frozen and without materially affecting the temperature of such space.

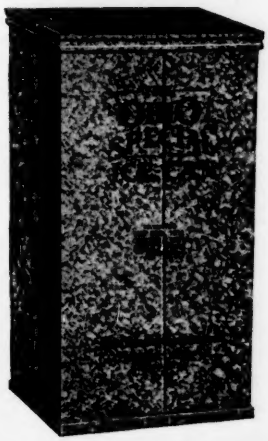

We're asking you to...
Return Your Empty Cylinders!
Help us give you the finest in service! Help us keep cool!
Local No. 1. Associated Polar Bears

Yes, please look around your plant and make sure that every ammonia cylinder has been returned. Armour will continue to do its part—assuring you prompt shipment of Armour's Anhydrous Ammonia in either 50, 100 or 150 pound cylinders. Armour's 65 conveniently located stock points can deliver your emergency order where you want it, when you want it and fast.

And remember, Armour's Anhydrous Ammonia is pure and dry . . . free of moisture and non-condensable gases. Every cylinder is tested before shipping to give you positive assurance of fine quality and to insure trouble-free operations.

ARMOUR *Ammonia Division*
Armour and Company
1355 West 31st Street • Chicago 9, Illinois
2501 83rd Street • North Bergen, New Jersey

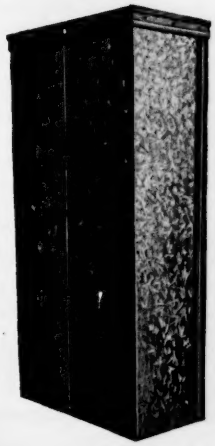
OHIO SPECIAL ICE CANS



Double Riveted
Welded
Integral Tube Cans
Can Baskets
Condenser Trough

• • • • • • • • • • •

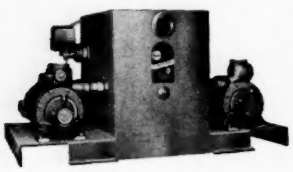
Industrial Trucks
and Trailers



THE OHIO GALVANIZING & MFG. CO.
NILES — *Established 1902* — OHIO

New Condensation Return Units

A LINE of Simplex and Duplex square tank condensation return units equipped with Apco turbine-type pumps is announced by the Aurora Pump Co. These units are designed for small low-pressure



APCO condensation return unit

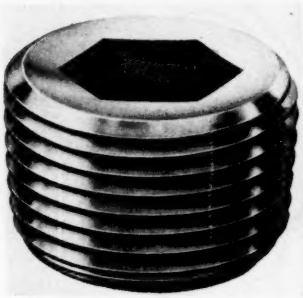
jobs, 40 to 40 lbs. Ability for efficently handling small capacities and, notably, high temperature liquids without vapor bind, provision being made for expansion and contraction due to different liquid temperatures, are fetaures claimed for these units. Bulletin 113-ST describes both simplex and duplex types, includes selection table, also dimension diagrams and tables.

New Automatic Ice Cube Maker

A FULLY automatic ice cube maker is announced by the Baker Refrigeration Corp., designed to meet the needs of hotels, bars, restaurants, night clubs, hospitals and other institutions. Two models are available, with air or water cooled hermetic condensing units, all stainless steel finish, with 4 to 6 bushels capacity per day. A four page circular has been issued illustrating and describing the machine.

New Pipe Plugs

TWO new hex socket pipe plugs which eliminate important causes of sealing failures are announced by the Allen Manufacturing Co. They are entirely pressure formed and threaded. Heads are cold drawn, retaining the full strength of the metal fibers instead of weakening the head by drilling and broaching. Pressure forming also makes a perfect hexagon socket with smooth, perpendicular walls and with no chips at the bottom.



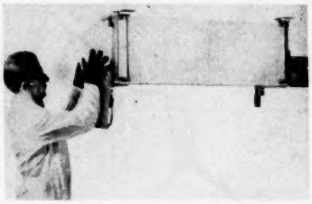
New hex socket pipe plug

The new Allen Dryseal pipe plug is designed for use with dryseal taps and was developed for use where a perfect seal is essential and any sort of sealing compound would be unsafe or inadvisable, particularly where extreme pressures are involved. Such applications include refrigeration; marine, automotive and aircraft fuel and oil line fittings; drain and filler plugs; ordnance gas shells and chemical bombs.

The new Allen pipe plug line is available immediately in a size range of 1/16 to 1¼ in. Samples and information on applications may be obtained by writing The Allen Manufacturing Company, Hartford 1, Conn.

New Truck Bunker for Dry Ice

THE Foster-Built Dry-Ice Truck Bunker is designed to make the most efficient use of dry ice and to afford effective truck refrigeration. Constructed of reinforced aluminum, the bunker holds the dry ice over a 2-inch enclosed air duct. A sirocco-type fan forces surrounding air



Foster Dry-Ice Truck Bunker

through this chilled duct and circulates the newly cooled air throughout the truck. The bunker is easy to install and maintain. The placement of four studs plus a simple wiring operation complete the installation. The bunker is hung on the studs and is easily removed when refrigeration is not required. The fan operates off regulation truck batteries. The two-block bunker, holding 100 lbs. of dry ice, weighs only 38 lbs., and the four-block size, which holds 200 lbs., weighs just 52 lbs.

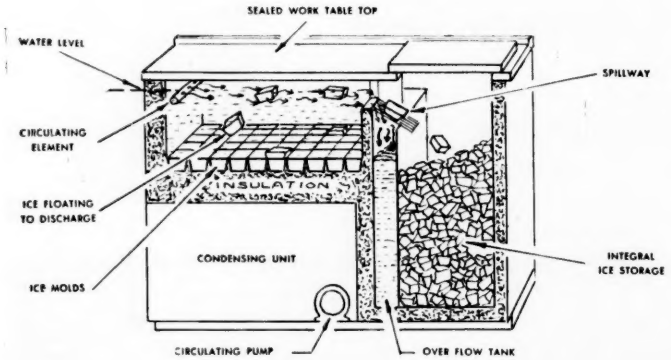
New Pipe Nipples in Packages

AN IMPROVEMENT in the merchandising of pipe nipples has been introduced by the Chicago Nipple Manufacturing Co., with the announcement of its standard package line. According to J. Lester Williams Jr., president of the firm, 93 different packs in each type and finish are available in standard quantities and sizes, ranging from ⅛ to 2 in. sizes and from close to 6 inch lengths. The packages are packed from 250 in the small sizes to 25 in the larger.

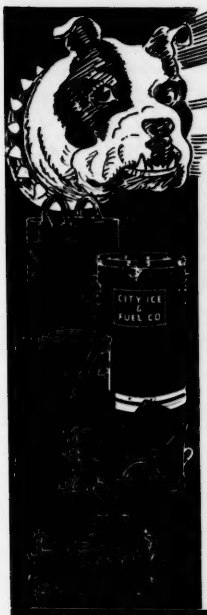
By making available standard packs in a very compact form, the company is affording a substantial saving in costs for the distributors through elimination of storage space and time in counting nipple orders. These same advantages also accrue to subsequent steps in the chain of distribution.

New Automatic Loader Crusher

A circular describing the Bateman Loader Crusher and Automatic Loader Sizer has been issued by the Bateman Foundry & Machine Co., Mineral Wells, Tex. These two machines are illustrated and described with specifications and sizes.



Parts and operating diagram of new Baker "Ice-Flo" ice cube maker



TOUGH
RUGGED

Stag Brand

KORO SEAL
TREATED CANVAS
AND
NO-FADE GREEN
TREATED CANVAS
ICE BAGS

can take it rough!

For the "thrifty" buyer who demands low maintenance cost — these "STAG BRAND" Metal Bottom ICE BAGS and BLOCK ICE CARRIERS are leaders!

Write for Illustrated Price List
Dept.-B

JOBBERS in PRINCIPAL CITIES

PITTSBURGH WATERPROOF CO.
2537 PENN AVE. • PITTSBURGH 22, PA.
57 WEST GRAND AVE. • CHICAGO 10, ILL.

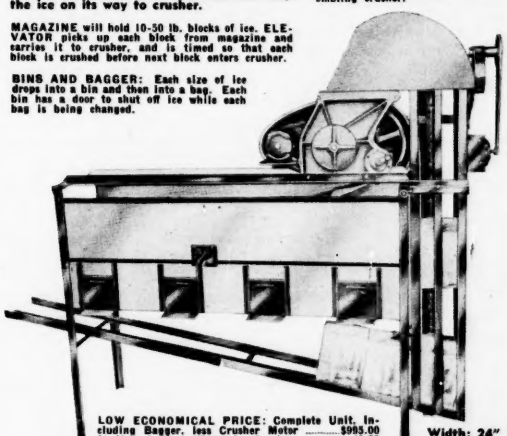
Save **TIME AND LABOR WITH THE BATEMAN** *Loader Sizer*

ONE MAN CAN DO THE WORK OF TWO . . . loader acting as second man. A control switch stops and starts elevator so that if operator needs more time he can stop the ice on its way to crusher.

MAGAZINE will hold 10-50 lb. blocks of ice. **ELEVATOR** picks up each block from magazine and carries it to crusher, and is timed so that each block is crushed before next block enters crusher.

BINS AND BAGGER: Each size of ice drops into a bin and then into a bag. Each bin has a door to shut off ice while each bag is being changed.

CRUSHER has 5 grate adjustments to help size ice before ice drops onto sizing slides. Crusher has 12 large teeth. New teeth can be installed without disassembling crusher.



LOW ECONOMICAL PRICE: Complete Unit, Including Bagger, less Crusher Motor $985.00
¾ H.P. 3 Phase Motor for Crusher 42.60
¾ H.P. Single Phase Motor 46.60

Width: 24"
Height: 8' 2"
Length: 8 ft.

All Inquiries Answered Promptly

BATEMAN FOUNDRY & MACHINE CO., INC.
Mineral Wells, Texas

Barrett
STANDARD ANHYDROUS AMMONIA

Backed by 59 Years of Experience

WHAT DO YOU WANT in a refrigerant? Do you want low initial cost, low power consumption, low friction losses, low vapor density, and highest refrigerating effect per unit liquid volume?

These characteristics, together with consistent purity and uniform quality, have made Barrett Standard Anhydrous Ammonia the outstanding choice of refrigerating engineers since 1890.

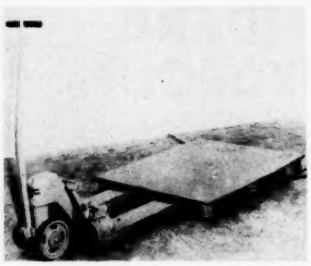
Barrett Standard Anhydrous Ammonia—the reliable, dependable, all-purpose refrigerant—is available in 150, 100 and 50-pound cylinders FOR SPEEDY DELIVERY from stock points conveniently located from coast to coast.

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.
4528 South Broadway, St. Louis 11, Mo.

Barrett

New Expendable Pallets Offered

EXPENDABLE four-way corrugated paper pallets having large cylindrical supporting columns can now be handled by a newly designed hand pallet truck which is being offered by the Lyon-Raymond Corp.



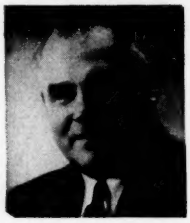
New Lyon-Raymond expendable pallet.

Lyon-Raymond engineers redesigned the standard lightweight hydraulic pallet truck, making each fork only 6 inches wide and allowing a 10 inch opening between the forks, thus making it possible to provide an overall width of only 22 inches. The capacity of this new truck is 2000 lbs. It has a lowered height of 3-¼ inches and an elevated height of 7-¼ inches. Full information may be obtained from the Lyon-Raymond Corp., 2504 Madison Street, Greene, N. Y.

MANUFACTURERS' NEWS

Abramson Joins Aurora Pump Co.

ERNEST ABRAMSON, development engineer with twenty years of experience in the development and design of turbine-type pumps has associated himself with the Aurora Pump Co. of Aurora, Ill. According to Frank S. Main, president of the Aurora firm, Mr. Abramson will participate in a broad development program involving new designs, new sizes and new applications for Aurora Centrifugal and Apco Turbine-Type Pumps. Mr. Abramson is a mechanical engineering graduate of Purdue University.



Ernest L. Abramson

Rea Eastern Sales Manager for Buildice

THE appointment of J. George Rea as eastern sales manager has been announced by Buildice Co. Inc., whose home office and factory are located in Chicago. Mr. Rea will be located in the Buildice Philadelphia office at 734 Land Title Bldg. He is a well known refrigeration engineer in the Chicago area, having been a sales representative for Buildice for over five years.

Marley Builds New Plant at Louisville

THE MARLEY COMPANY, INC., manufacturer of water cooling towers, nozzles and dry surface coolers, has started production in a new plant at Louisville, Ky. C. W. Zimmerman is plant manager. Extensive modernization of the plant building has been completed. A new building is being added and a large area hard-surfaced for storage purposes. New facilities have been installed for loading and unloading trucks, and another spur track for railroad cars has been added. The Louisville plant will primarily fabricate metal for Marley products, but will also assemble some of the smaller units.

Pennsalt Makes Changes In Sales Personnel

THE appointment of Albert H. Clem as assistant manager of sales of the special chemicals division, Pennsylvania Salt Manufacturing Co., has been announced by William P. Drake, vice president in charge of sales. Mr. Clem, who has been field sales supervisor of the division, also will assume the duties formerly performed by Philip C. Staples, Jr., as product supervisor on cleaners. Mr. Staples has been transferred to the company's heavy chemicals division as a product supervisor.

MARTOCELLO ICE PICKS

"Cost You Less To Buy The Best"

Immediate Delivery on Plain Handle Ice Picks

BLADES

of High Carbon Tool Steel, accurately tempered to give you maximum use.

HANDLES

of Sound, Clear Hard Wood with Protective Flexible Lacquer Coating.

FERRULES

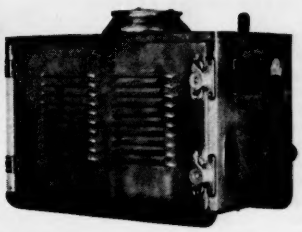
of Pressed Steel securely registered on Handle and Plated to Resist Corrosion.

PRICES ON PLAIN AND PRINTED HANDLES HAVE BEEN REDUCED! WRITE TODAY FOR NEW PRICES.

Jos. A. Martocello & Co. 229-231 NORTH 13th STREET PHILADELPHIA 7, PA.

"Serving the Ice Industry Since 1916" *"There is no Substitute for* MARTOCELLO QUALITY"

control odors and mold



USE GENERAL OZONE EQUIPMENT wherever eggs, vegetables, cheese, fruits, meats and fish are stored . . . then watch food spoilage go down and profits go up.

Let General Ozone engineers solve your odor and mold problems. General Ozone has a complete line of modern ozonizing equipment plus full service facilities for both old and new types. Write us today for further information.

GENERAL OZONE CORPORATION

7 West Sixtieth St., New York 23, N. Y. 1455 West Congress St., Chicago 7, Ill.

MODEL C-2
Approved by Underwriters' Laboratories, Inc.

Manufacturers of ozone generating equipment for cold-storage • warehouses refrigerated cars • walk-in coolers • air recirculating systems • homes • garages • hospitals

QUALITY COILS FOR *ALL* APPLICATIONS

WELDED HEADERS, PIPE BENDS AND AMMONIA RECEIVERS

Whether your next job be for a single bend, or coil or complete piping system, Chicago Nipple can supply your requirements. Experienced workmen, practical engineers, and modern equipment reflect the quality of our products.

Coils are of selected ammonia pipe—all joints are electrically welded—checked under water with an air pressure of 300 pounds to guarantee tightness.

SEND DRAWING OR BLUE PRINT FOR QUOTATION

CHICAGO NIPPLE MFG. CO.

1997 Clybourn Ave., Chicago 14, Ill.

PROTECT

TANK TOPS • LIDS WALLS • MACHINERY FLOORS

AND OTHER SURFACES . . . KEEP THEM CLEANER . . . They'll Even LAST LONGER

When Properly Painted! CSCO GREY PAINT Is Made Especially For Ice Plant Service!

GUARANTEED AS GOOD

OR BETTER THAN ANY OTHER PAINT OR COATING ON THE MARKET OR YOUR MONEY REFUNDED!

CSCO CAN, COIL AND CONDENSER COATING IS A BLACK PHENOLITHIC COMPOUND . . . Excellent For Coating:

Ice Cans Above or Below Brine Levels.
Also Condensers and All Other Surfaces Immersed in Either Brine or Water or Exposed to the Atmosphere.

PACKAGED IN ALL SIZE CONTAINERS.

CHEMICAL SOLVENT COMPANY

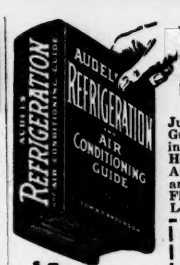
3005—16th Street North Birmingham, Ala.

THIS THOMAS TRUCK MADE MANY WAYS

All 6 trucks pictured here have the same chassis. Only the superstructures are different. Thomas has more than 1000 different types of stake, rack, box and shelf superstructures cataloged, which makes easy the selection of a "job-suited" truck. Series 3400 truck at right. Hardwood frame, round corners. 10 platform sizes. Write for catalog.

THOMAS TRUCK AND CASTER CO.

3194 Mississippi River Keokuk, Iowa



$4 COMPLETE

PAY ONLY $1 A MO.

Get this information for Yourself. Mail Coupon Today. No Obligation Unless Satisfied. ASK TO SEE IT.

AUDELS
REFRIGERATION
and AIR CONDITIONING GUIDE

ANSWERS YOUR QUESTIONS

Just Out! Audels Refrigeration & Air Conditioning Guide for Engineers, Servicemen & Shopmen. Covering Principles, Servicing, Operation & Repairs of Household Special, Commercial & Industrial Units & Air Conditioning. 1280 Pages. All Fully Illustrated and Indexed for Ready Reference. Valuable Facts & Figures including data on Freon, Quick Freezing, Lockers, Water Coolers & Air Conditioning Systems.

AUDEL, Publishers, 49 West 23rd St., New York 10

MAIL AUDELS NEW REFRIGERATION GUIDE for free examination. If O.K. I will send you $1 in 7 days; then remit $1 monthly until price of $4 is paid. Otherwise I will return it.

Name_____

Address_____

Occupation_____

Employed by_____ 2

Pabco Announces Kreider Appointment

FRANK B. KREIDER has been appointed the eastern and mid-western regional manager of Pabco's Insulation Division with headquarters at The Paraffine Companies, Inc. Offices, 295 Fifth Avenue, New York City. Mr. Kreider takes over the duties formerly performed by J. C. Voiles who was transferred several months ago to The Paraffine Companies, Inc. head office in San Francisco. He will directly co-ordinate the service activities of all eastern and mid-western Pabco Engineering Service Units, through which Pabco high temperature insulations are distributed and installed.

New Baker Distributors

BAKER Refrigeration Corp. announces the appointment of Birmingham Gas Heating and Air-Conditioning Co. and Flint Refrigeration Co., Inc. as a dual distributorship to handle Baker Ammonia and Freon Refrigeration equipment as well as Baker's Air-Conditioning line of equipment for the Northern half of the State of Alabama. Birmingham Gas Heating and Air-Conditioning Co. will emphasize air-conditioning installations while Flint Refrigeration Co., Inc. will emphasize refrigeration applications.

CONTINUOUS PERFORMANCE

5 to 20% Increase in CAPACITY

Safe and Reliable Operation

Up to 25% Saving in power cost

One Machine Usually Does the Work of Two

after installing

J. H. H. VOSS VALVES

REG. U.S. PAT. OFF.

in your COMPRESSORS

We will be glad to submit estimates if you will send us the name, bore, stroke and speed of your air, gas or ammonia compressors of any type or size.

READ WHAT ONE MEAT PACKER SAYS—

"The set of VOSS VALVES, which we installed in the 200 ton motor-driven compressor, enabling us to speed it up 20%, are working satisfactorily and have enabled us to secure additional tonnage, without any other changes."

Name of meat packer and copy of letter will be sent on request

Dependable service during your peak season... without any shutdown due to valve trouble... carrying full capacity rated loads of your equipment... with no additional expense for added refrigeration or ice packing... when you install trouble-free VOSS VALVES.

J. H. H. VOSS CO., Inc. 785 East 144th Street NEW YORK 54, N.Y.

Link-Belt Promotions

THE Link-Belt Co., Chicago, Ill., announces the following promotions:

Allan Craig, sales manager of the company's southeastern division since 1945, with headquarters in Atlanta, is being transferred to Houston, Tex. in the capacity of general manager of the southwestern division, where a new Link-Belt plant is about to be opened.

Allan Craig

Michael J. Perry

Michael J. Perry, district manager at Moline, Ill. since 1946, has been appointed sales manager, southeastern division, with headquarters at the Atlanta plant, to succeed Mr. Craig in that capacity.

Andrew K. Kolar

Andrew K. Kolar, district sales engineer at Moline, Ill. since 1947, has been appointed district manager, in full charge of this office.

Water Conditioning Firms Join Forces

TWO pioneer water conditioning concerns, the Elgin Softener Corp., Elgin, Ill., and the Illinois Water Treatment Co., Rockford, Ill., have joined forces, according to an announcement by Chester T. McGill head of the Elgin organization. Announced purpose is to make it possible to provide a better, more complete service.

Under the new set-up, each company will maintain its name identity and personnel. Associated with Mr. McGill in the organization are E. W. Scarritt, C. Scribner and B. F. Willey, each of whom has had some 20 years' experience in the field. W. S. Morrison and P. H. Caskey of Illinois Water Treatment, pioneers in the develop-

PITTSBURGH
Air Pressure Tested COILS

Electrically welded, continuous; Air-Pressure-Tested while submerged in water. Built to your specifications. Send for new Coil Data Book and let us quote.

Welded Headers—Welded Ammonia Receivers
Accumulators—Pipe Coils—Bends—Boilers Tubes

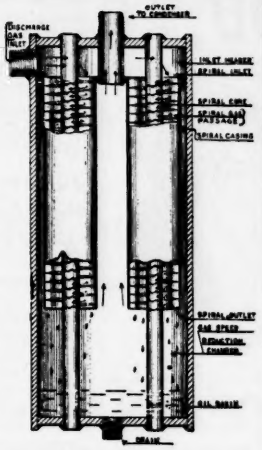
Pittsburgh Pipe Coil & Bending Company
61 BRIDGE STREET, ETNA, PITTSBURGH 25, PA

"King Zeero"
OIL SEPARATOR

STOPS OIL FROM ENTERING CONDENSER RECEIVER AND LOW SIDE

Allows operation as was originally intended. Simple in operation — no parts to wear out — no screens, metal wool or any close screens to clog, raise discharge pressures and cut down capacity.

When used in connection with air compressors, water is also separated with the oil.



Built for years of trouble free service.
Mechanical details on request.

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TBU—Illustrated
Top Angle Stream Bubbler
"All Purpose" Pressure Type Water Cooler. 38 ft. copper coil. 75 lb. ice capacity. Rear outlet and inlet water connections for easy installation.

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ICE WATER COOLERS ARE AVAILABLE IN 9 MODELS TO SERVE ANY DRINKING WATER NEED

CABINETS OF SATIN FINISH ALUMINUM

WON'T RUST OR CORRODE

SPECIFICATIONS

- Solid Cast Aluminum Top On All Deluxe Models
- Polished Chrome-like Finish On Deluxe Tops
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- Large Re-icing Opening On All Cabinets

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Model WP-92

INCREASE YOUR PROFITS BY DELIVERING FRESHLY BROKEN ICE IN SIZES FOR ALL NEEDS RIGHT AT THE DOOR

- Instantly Adjustable Grate
- Diamond Point Picks
- Easy Starting Briggs & Stratton Engine.

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ment of de-ionizers, are recognized authorities in the field of ion exchange.

An important part of the plan is an integration program which will broaden the scope of services available through a nation-wide organization of sales engineers and technical field men with offices in forty principal cities. The Elgin company has established a Manufacturers' Division to make available its improved technique to other manufacturers in the industry. Zeolite is also being made available through Elgin's recent acquisition of Arizona Minerals Corp., Yuma, Ariz.

Baker Industrial Truck Div. Moves

THE general offices including the purchasing, sales, engineering and service departments of the Baker Industrial Truck Division of The Baker-Raulang Co., has been moved to 1250 West 80th Street, Cleveland 2, Ohio. The division's manufacturing operations, presently located at the West 25th Street plant, will be moved to the 80th Street location within the near future. The company manufactures a complete line of electric power industrial trucks, tractors and cranes.

Refrigeration Service from Coast to Coast

CP either makes or can provide you with leading makes of

Shell and Tube Condensers

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Evaporator Condensers

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Ammonia Fittings

•

Ammonia Controls

•

Whether you need refrigeration for an ice plant, a cooling plant, brewery, cold storage plant, skating rink or curling rink, you'll find it worthwhile to check CP's manufacturing, engineering and servicing facilities. Whether your operation will be best served by a 2-cylinder or 6-cylinder, single stage or booster refrigeration system, CP makes it . . . assuring you one source of complete supply and a single, undivided responsibility. Write for Bulletin.

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THE CREAMERY PACKAGE MFG. COMPANY, LTD.
Avery House, Clerkenwell Green, London, England

CATALOGS AND BULLETINS

New Bulletin On Purgers

A NEW bulletin on purgers for refrigerating systems has been published by Armstrong Machine Works, Three Rivers, Mich. Designated as Bulletin No. 192, it describes the operating difficulties noncondensable gases cause in the system and the benefits obtained from proper purging. Then the operation of the Armstrong purger is described and several diagrams are given to guide installation for different types of service. The bulletin is well illustrated and gives clear explanation of the various phases of the subject.

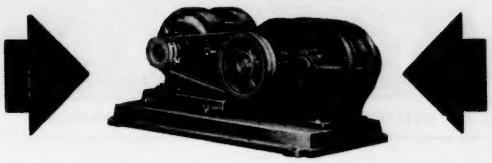
A chart shows the added cost of operating with needlessly high head pressure. A table is provided to check condensing pressure against the saturation pressure indicated by the temperature of the liquid ammonia or Freon-12 draining from the condenser. Prices and specifications are given for the purgers as well as a price schedule for valves and accessories used in connections to the system.

Bulletin on High Side Floats

A REVISED bulletin on high side floats for ammonia, Freon, sulphur dioxide and methyl chloride systems has been issued by the Armstrong Machine Works, Three Rivers, Mich., (Bulletin No. 1781). Described in the text are the inverted bucket floats used to maintain a liquid seal while passing all the condensed liquid back to the low side. In such a system there is no reservoir of liquid in the receiver and a smaller refrigerant charge can be utilized. On more conventional systems these floats are also installed as a precautionary measure to insure that a liquid seal is maintained at all times. The bulletin also illustrates the use of multiple floats on jobs having widely variable load characteristics. A price list and dimension detail table are included.

New Henry Valve Catalog

A new catalog describing all its products with exception of fittings has been issued by the Henry Valve Co. It includes illustrated descriptions of packless and packed valves, relief and check valves, strainers and driers, and liquid level gauges for refrigeration, air conditioning and industrial applications. Any reader may obtain a copy by writing to the Henry factory at 3215 W. North Ave., Melrose Park, Ill.



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You can have any amount of air you need when you use R-C Blowers. We build them from 10 CFM up to any desired capacity—with pressures to suit your specific needs and with direct-connected motor, V-belt or other drive.

You determine the volume of air and pressure you want, and your R-C Blowers will deliver it—just as these sturdy, simple, dependable units have been delivering for ice plant operators for many years.

You'll need to move promptly for this season's operations. Send for details in Bulletin R-C 1247, or we'll help you select an R-C Blower to match your needs.

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One of the Dresser Industries

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NEW, BETTER, ICE CUBES

"ICETTES"

Crystal Clear
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Produced

ECONOMICALLY and AUTOMATICALLY
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Nationally Known for the Best

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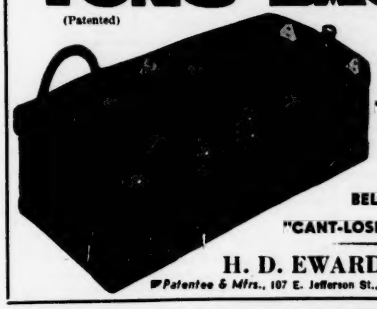

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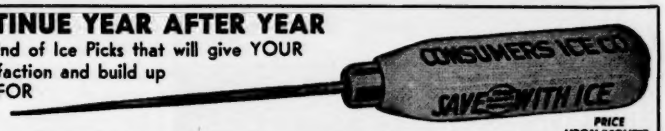
to make the kind of Ice Picks that will give YOUR customers satisfaction and build up GOOD WILL FOR YOU.



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Est. 1880
"THE OLDEST NAME IN REFRIGERATION"

- **AMMONIA COMPRESSORS**
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  Flanged and screw ends in all sizes from ¼" to 8"
- **BACK PRESSURE VALVES**
  For ammonia and Freon in all sizes from ¾" to 6"
- **FLANGES AND FITTINGS**

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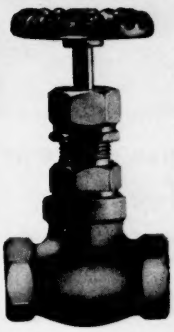

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Compact — Machined from bar stock steel — Full size ports — Completely rust-proofed — Highest grade graphited composition packing. All popular sizes.

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AIR CONDITIONING AND REFRIGERATION

in Freon and Ammonia

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Lilly Co., The, Memphis, Tenn.
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Reynolds Mfg. Co., Springfield, Mo.

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ICE BLOWERS
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Link-Belt Co., Chicago, Ill.

ICE CAN FILLERS
Frick Co., Waynesboro, Pa.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Martocello & Co., Jos. A., Philadelphia, Pa.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Refrigeration Engineering Corp., Philadelphia, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

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Kehoe Machinery Co., Inc., R. P., New York, N. Y.
Knickerbocker Stamping Co., Parkersburg, W. Va.
Martocello & Co., Jos. A., Philadelphia, Pa.
Ohio Galvanizing & Mfg. Co., Niles, Ohio
Refrigeration Engineering Corp., Philadelphia, Pa.

ICE CHIPPERS
Gifford-Wood Co., Hudson, N. Y.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Co., Minneapolis, Minn.
Refrigeration Engineering Corp., Philadelphia, Pa.
United Ice Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

ICE CHUTES
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Gifford-Wood Co., Hudson, N. Y.
Jamison Cold Storage Door Co., Hagerstown, Md.
Link-Belt Co., Chicago, Ill.
Martocello & Co., Jos. A., Philadelphia, Pa.
Refrigeration Engineering Corp., Philadelphia, Pa.

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Lilly Co., The, Memphis, Tenn.
Link-Belt Co., Chicago, Ill.
Refrigeration Engineering Co., Minneapolis, Minn.
United Ice Supply Co., Boston, Mass.

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Frick Co., Waynesboro, Pa.
Vogt Machine Co., Henry, Louisville, Ky.

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Gifford-Wood Co., Hudson, N. Y.

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Thermo Cuber Co., Chicago, Ill.
United Ice Supply Co., Boston, Mass.

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Lilly Co., The, Memphis, Tenn.
Martocello & Co., Jos. A., Philadelphia, Pa.
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United Ice Supply Co., Boston, Mass.
Vivian Mfg. Co., St. Louis, Mo.

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Mundet Cork Corp., Brooklyn, N. Y.
Pacific Lumber Co., San Francisco, Calif.
Pittsburgh Corning Corp., Pittsburgh, Pa.

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Thomas Truck and Caster Co., Keokuk, Iowa

LOW TEMPERATURE EQUIPMENT
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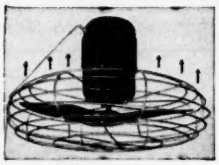

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Pittsburgh Pipe Coil & Bending Co., Pittsburgh, Pa.
Rempe Company, Chicago, Ill.
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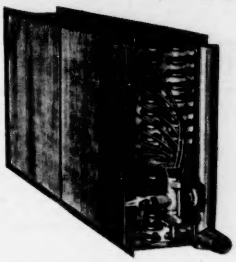

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Pressure 7 lbs. to 55 lbs. p.s.i. Complete with fitting for either 1" or 1¼" ID Hose.

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All classified advertisements are payable in advance. Except for Positions and Help Wanted classifications, this section is reserved exclusively for the purchase and sale of USED equipment, existing and used plants, and surplus material.

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WANTED—Shift engineer for electric-driven ice plant; 250 ton daily capacity. In reply, give experience. Globe Mills, Inc., El Paso, Texas.

POSITION WANTED—as chief engineer or superintendent of the refrigeration facilities for a brewery, meat packing plant, chain of ice plants, railroad car icing system or similar organization. Am a young married man, veteran of the last war. Have had fifteen years experience in the design, erection and operation of refrigerating machinery, covering almost every phase of its application. I will gladly furnish, upon request, any information desired as to my character, experience and ability. Address Box MY-7, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

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To reflect on business indices is not enough. To be alarmed by politicos and professional warners is tiresome. A transfusion is what some of you need!

A thoroughly competent executive, with pre-war competitive experience, now manager of well occupied refrigerated and general merchandise warehouse, but desiring a regional relocation, will be glad to confer with you. Progressive, but not high pressure. Address Box JU-2, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

ICE PLANTS—*Wanted and For Sale*

FOR SALE—Contract for twenty-two ton Frick ice plant, consisting of 256 cans, one 7x7 and one 5x5 compressor, evaporator condensor. To be delivered during November 1949. Manufacturers price; with my deposit payable now. Address Box JU-4, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

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LARGE ICE PLANT

4 Ingersoll-Rand ammonia compressors, 50, 90 & 100 tons, direct connected to synchronous motors. 1 York 6½ x 6½ h.s. V belt, forced feed lubrication. 1 York 6½ x 6½ slow speed. 3 transformers. 500 ice cans 300#. 2 large brine coolers. Electric cranes. 1000' - 2" ammonia pipe with return bends, like new. 4 high pressure boilers.

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FOR SALE—650 ice cans, 300 # cap., 11x22x46, riveted, no leakers, weight 77#, good useable condition. $2.75 each. Also available ammonia and Freon compressors, ice crushers, ice flakers, air conditioning units. Barliant & Co., 7070 N. Clark St., Chicago, Ill.

FOR SALE—York compressor 7½x7½, Y-15, $750.00; York 6½x6½ $600.00; York 3x3 self-contained, $250.00; York ½ h.p. Freon self-contained $125.00; Frick 4x4 $300.00; Frick 5x5, $450.00; Brunswick 5x5 $125.00; Creamery Package 3¾x3¾ $200.00; King Zeero vertical brine cooler 7'6"x30", $100.00; ammonia receiver, 6'x12"; 10'x15"; 4'x10", price $40.00 each; Boston type ice tongs 75 cents each. Ammonia valve, brine tank, and fittings; write us your requirements. Gordon Equipment Co., 6530 W. Jefferson Ave., Detroit 17, Mich.

USED MACHINERY—*Wanted and For Sale—Cont.*

WANTED—In the market for any good used refrigerating and ice making equipment you may have for sale. Address Box DC-19, Ice and Refrigeration, 435 N. Waller Ave., Chicago 44, Ill.

FOR SALE—Two 36"x15' vertical shell and tube ammonia condensers, 2" tubes 1120 sq. ft. surface. One 30"x16' ditto 806 sq. ft. all completely retubed. One 8"x8" York high speed vertical twin ammonia compressor—completely reconditioned, new bearings, piston rings, shaft packing, etc., with grooved wheel. Michigan Ice Machine Co., 617 E. Fort St., Detroit 26, Mich.

FOR SALE—York compressors all sizes from 3x3 to 9x9, splash lubrication 3x3 and 4x4 self-contained units. Two 10 h.p. Freon units with 8 blower units, suspended type. Four 8" x 18' shell & tube Vogt condensers, seven 2" tubes in each shell, 40 ton capacity. One 10 ton, one 15 ton Vilter shell & tube condensers. One 16" x 10' receiver. One 20 ton York float with by-pass. Eight 1-¼" Alco magnetic valves. Write E. Niebling, 1318 St. Clair Ave., Mt. Healthy Cincinnati 31, Ohio.

FOR SALE—Complete 20 ton Arctic Pownall ice making plant with two compressors; 1 each York 9x9, Frick 6x6, York 5x5 self-contained unit, Baker 4½x5 self-contained unit. Lipman 4 ton self-contained unit. 1 ton York flake ice. 1 h.p. Frigidaire Freon unit. 1½x5" weld return bends. Frick 10x10 crank shafts and pistons. 1 each 150 and 180 h.p. Fairbanks-Morse Diesel engines; 1 each 40 and 60 KVA generators complete. Freezer doors, pipe coils, ammonia fittings. 1—15 h.p. DC G.E. motor. 1—25 h.p. G.E. motor. Parke Fettewgrew & Son Co., 370 West Broad St., Columbus 8, Ohio.

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1—35 ton York plant Diesel driven.
1—30 ton York plant electric driven—4 can pull.
1—12 ton York plant electric driven—2 can pull.

COMPRESSORS

1—16x18 York direct connected to synchronous motor.
1—11x13 York direct connected to synchronous motor.
1—10x10 Frick direct connected to synchronous motor, F.F. lubrication.
1—10x10 Frick medium speed.
1—9x9 Frick 360 r.p.m. F.F. lubrication.
1—7½x7½ York 360 r.p.m F.F. lubrication.
1—7½x7½ York 225 r.p.m.
1—7x7 Frick 360 r.p.m. F.F. lubrication.
1—6½x6½ York 360 r.p.m F.F. Lubrication.
1—6¼x6¼ Baker 360 r.p.m. F.F. lubrication.
1—6x6 York 360 r.p.m. F.F. lubrication.
2—6x6 Yorks 200 r.p.m
1—5x5 York self contained unit 20 h.p. motor.
1—5x5 York 360 r.p.m
1—5x5 Frick 277 r.p.m
2—3x3 or 4x4 York or Frick self-contained units.

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1—30 ton York ice plant, electric driven, herringbone coils, late type.
1—50 ton York ice plant electric driven, herringbone coils, late type.
1—12½" x14½" two-cyl. York ammonia compressor, direct connected to 150 h.p. G.E. synchronous motor.
1—10"x10" 2 cylinder Frick compresor high speed.
1—9"x9" two cyl. Frick compressor, medium speed.
1—6½"x6½" two cylinder York ammonia compressor, high speed.
1—6"x6" two cylinder Frick ammonia compressor, medium speed.
2—6"x6" two cylinder late model h.s. York compressors.
1—6"x6" two cylinder Voss high speed ammonia compressor.
1—5"x5" two cylinder York high speed ammonia compressor.
2—4"x4" two cylinder York high speed ammonia compressors.
1—3"x3" two cylinder Frick unit, high speed.
York shell and tube condenser 28" dia. x 16' L., 51—2" tubes.
1—25" dia. x 10'0" long 5 pass enclosed type ammonia condenser.
3—16" dia. x 10'0" long 6 pass enclosed type ammonia condensers.
2—43" x 16'0" long 5 pass enclosed type shell and tube brine cooler, having 275—1¼" tubes.
1—40"x15' long 8 pass enclosed type shell and tube brine cooler, having 112—2½" tubes.
2—Perfection ice scoring machines, 300 lb. blocks.
500—11"x22"x48" ice cans.

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6—6x6 York's, 200 RPM 20
1—6x6 Frick, 257 RPM 21
2—6½x6½ Arctics, 350 RPM, forced feed lub. 30
1—7¼x7¼ Baker, 350 RPM, forced feed lubrication 35
1—7x7 Frick, 200 RPM 40
1—7½x7½ York, 225 RPM 50
1—7½x7½ York, 200 RPM 51
1—8x8 Arctic, 300 RPM. forced feed lub. 60
1—9x9 Arctic, 300 RPM, forced feed lub. 62
1—9x9 Frick 225 RPM direct connected to a 60 HP synchronous motor, forced feed lubrication 67
1—9x9 Frick, 200 RPM 70
1—9x9 York, 200 RPM 71
1—9x9 Worthington, 325 RPM, forced feed lub. 72
1—10x10 De La Vergne, 360 RPM, forced feed lub. 73
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1—10x10 York, 257 RPM, forced feed lub. 80
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3—10x10 York's, 225 RPM, semi-forced feed lub. 82
1—11x13 York, 164 RPM, forced feed lub. 90
1—17x18 Frick, direct conn. 300 HP synch. motor 91

Diesel Driven and Diesel Engines

1—8x8 York—Direct connected to 50 H.P. Fairbanks Morse at 257 R.P.M. 210
1—175 H.P. Fairbanks Morse Diesel engine 211
1—150 H.P. Van Severin—300 R.P.M.—Diesel engine 212

Steam Driven

1—18 ton Vertical 6½x6½ Arctic 321
1—250 ton Horizontal De La Vergne—18x24—with Ames Una Flow engine 325
1—7½x7½ Vertical York, 200 R.P.M. direct connected to steam engine 326
1—8x8 Vertical York, 300 R.P.M. direct connected 327

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10,000 feet wrought Iron pipe—2"—like new 451

Scoring Machines

2—Giffords wood 512

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Item No.

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1—65-ton York plant, 749 cans 629
1—15-ton electric driven plant 630
1—600 Can Trunk Coil Type—York Plant, Brand New Tank. *Complete with 10 Can Grids. This plant is equal to new* 631
Brand New 8 to 10-ton Clear Ice-Making Plants—110 Cans—Electric or Diesel Drive—2 Can Pull 632
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2—4x4 Yorks—390 R.P.M. 742
1—5x5 York—390 R.P.M. 743
1—4½x5 Lipman—360 R.P.M. 744
1—3x3 Worthington 748
1—4x4 De LaVergne, 400 R.P.M. 760

Brine Coolers

1—34x12—96—2—Retubed 801
1—34x10—100—2 802
1—48"x16'—130—2" tubes 808

Condensers

3—100 ton shell and tube condensers retubed 919
2—Stands—Vogt Multi-tube—Each stand 6 pipes high. Each pipe 9"x18" with 7—2" tubes 920
1—125-ton, Vertical Shell & Tube, 196 2" tubes 921
1—120 ton, 216—2" retubed Vertical Shell & Tube 922
1—50 ton Horizontal—retubed 923
2—20 ton Horizontal—retubed 924

Ice Cans

96—11½"x22½"x46"—Refinished in zinc
400—11½"x22½"x44" refinished in zinc

Ice Cubers

1—100 lb. Uline Automatic Cuber

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1—100 H.P. Westinghouse Motor—V Belt Drive

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5x5—Self contained—15 H.P. motor—V Belt 1004

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2—30x14 Vertical 109—2" tubes 1021
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50—100 lb. cans—15½"x8"x31" 1041
40—50 lb. cans—6"x12"x26" 1042

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½" to 2"—Screwed Globe Valves 1051

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All sizes 1080

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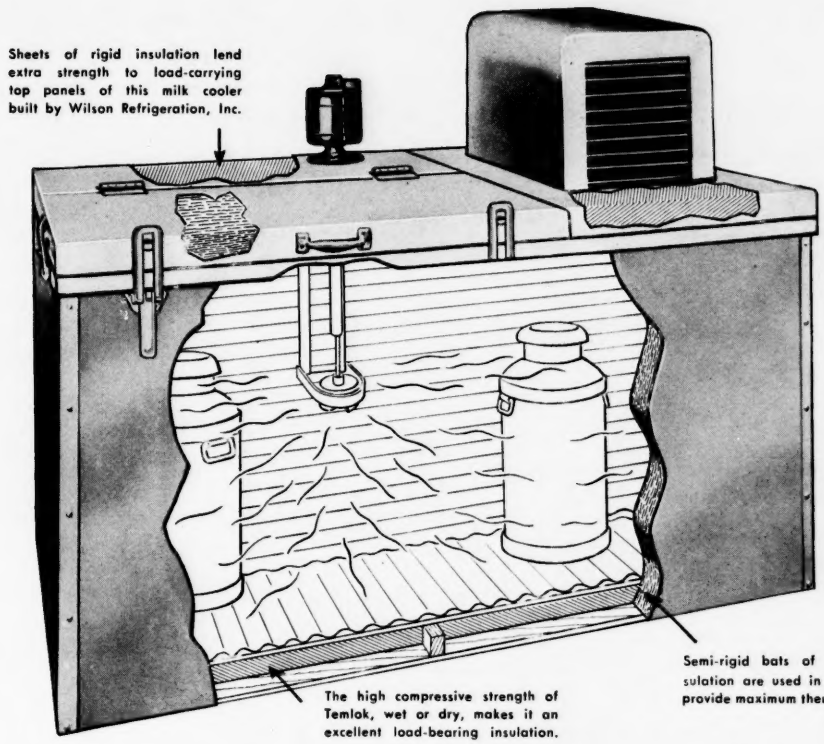
Sheets of rigid insulation lend extra strength to load-carrying top panels of this milk cooler built by Wilson Refrigeration, Inc.
Semi-rigid bats of Fiberglas insulation are used in side walls to provide maximum thermal efficiency.
The high compressive strength of Temlok, wet or dry, makes it an excellent load-bearing insulation.

Use of Rigid Insulation In Refrigerated Equipment Design

Good design of refrigerated equipment often calls for the use of more than one type of insulating material. In the milk cooler illustrated above, for example, Armstrong's Temlok®, a rigid fiberboard insulation, is combined with semi-rigid bats of Fiberglas* to improve over-all design.

In the bottom of this cabinet the high compressive strength of Temlok, wet or dry, helps support the heavy load of milk cans and water. Temlok is also used under the compressor and in the top section carrying the agitator. Front lid and side walls are Fiberglas insulated for high thermal efficiency.

There are other places, too, where equipment manufacturers take advantage of the high strength and rigidity of Temlok. In bottoms of beverage coolers, walk-in refrigerators, and other types of equipment, strips of Temlok help carry the load. Sheets of Temlok secured to the framing members in wood framed equipment give extra rigidity to the entire construction. When using Temlok in these applications, many manufacturers back it up with Fiberglas to obtain maximum efficiency with minimum thickness.

If you are currently manufacturing or are planning to make any piece of equipment insulated with an Armstrong insulation or a combination of Armstrong materials, you may find out in advance how that equipment will perform in service. Armstrong's Life Test Room, without charge, will put your equipment through a series of tests that are equal to three to five years of actual operation. A confidential report then gives you all the results.

For complete information on any of Armstrong's Equipment Insulations—Temlok, LK® Corkboard, or Fiberglas—or for details on Armstrong's "Life Test," write today to Armstrong Cork Company, 4506 Queen Street, Lancaster, Pa.

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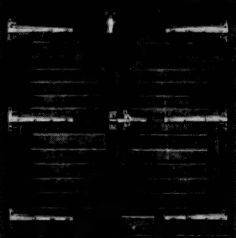

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TRACK DOOR

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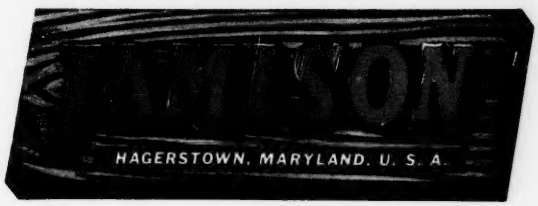
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